Chemical Engineering

J. ELTON TUOHIG Publisher CECIL H. CHILTON Editor-in-Chief

In August 1946 Chemical & Metallurgical Engineering was renamed Chemical Engineering. Chemical & Metallurgical Engineering was the successor to Metallurgical & Chemical Engineering, which, in turn, was a consolidation of Electrochemical & Metallurgical Industry and Iron & Steel Magazine. The magazine was originally founded as Electrochemical Industry.

McGRAW-HILL PUBLISHING COMPANY, INC., NEW YORK CITY

Volume 70

January to December 1963

GENERAL ALPHABETICAL INDEX

A		Adsorption		Petrochemical show and meeting in	9.0
Acetaldehyde		Esso's heatless adsorption process for		New Orleans (N)	90
Acetaldehyde via German one-stage	,	purification of gases wins CE achievement honorsNov. 11	*236	UCL 11-88, (C) UCL 48	9.4
ethylene oxidation process at Shaw-	*66	Esso's pressure-swing adsorption process for hydrogen purification	1	Waste water renovation gets thorough airing at Puerto Rico meeting (N)	
inigan (N)	-00	(C)July	6 63	Nov. 11	*124
ene oxidation at Shawinigan-flow-	****	Fluidized system recovers carbon di-		American Power Conference-Nuclear	
sheet. Eugene GuccioneDec. 9 Acetic Acid	*150	sulfide at viscose plant (chart)	92	power, direct conversion get quick	60
Corrosion of metals by acetic acid.		(N)		scan (N)	
Eisenbrown & Barbis (tables). Apr. 29	8110	liquid or vapor adsorption (C)		cation—Survey on engineering edu- cation for the 21st century. Nov. 11	254
Union Carbide process will get new	7.50	Sept. 16 Advertising—Advertising helps all. L. H.		Amines—Diglycolamine now available	201
plant at Brownsville, Tex. (C),		Hodges (QED)	236	here in large quantitiesOct. 28	94
Acetone .Oct. 28	72	Hodges (QED)		Ammonia producers ride high on fer-	
Gas-clean-up process uses acetone to		complex near Sasolburg, South Africa (C)	31	tilizer boom—output, end-uses	
remove carbon dioxide (N)July 8 German aldehyde technique can now	86	Agitation-Propeller agitator selection.		(charts & table) (N)Sept. 30	*40
make acetone (charts) (N). Sept. 30	48	A. P. Weber (charts & tables) Sept. 2		Bigger ammonia plants suggest shift to centrifugal compressors (N)	
Improved design for acetone strippers.		Agricultural Chemicals		Aug. 19	*88
Mohammad Bashar (charts) (P. N.) Feb. 18	174	Ag-chemicals enjoy continued growth		Casale process for producing anhy- drous ammonia—flowsheet. Carra &	
Acetylene		-CPI review and forecast report Jan. 21	*100	McAllister	*62
Chemical intermediates from acety-	52	Keeping pesticides on a moving tar- get (chart & table) (N)Mar. 18		Aniline	
lene	0-	get (chart & table) (N)Mar. 18	9.0	Aniline-based polyisocyanates gain in foams (C)Nov. 11	117
tini process doesn't work (C) May 13	8.3	Car crankcase devices become manda-		Catalytic aniline plant to be built by	445
Submerged flame makes acetylene	8.5	tory in San Francisco (C) Nov. 25	50	American Cyanamid (C)Nov. 11	115
from crude oil (chart) (N)Oct. 14	92	Federal action likely? (N)Feb. 4	4.6	Asphalt offers new outlet for asbestos	
Acids Carbogen oxidation process makes		How to get the most from air-pollu- tion control systems. Yocum &		fibers (N)	92
acids from armomatics (C) Mar 18	84	Wheeler (charts & table)June 24	*126	Paper from Japan won't burn at up to 950 F. (C)Sept. 2	32
An easy way to estimate pH of weak		Refuse burner—costly unit avoids air pollution (N)July 8	82	Asphalt	
An easy way to estimate pH of weak acids or bases. R. K. Finn (churts) (P. N.) Fatty acid flux facilitates hot-dip tinning (C) Fumaric-from-henzenePflzer's, oats	114	Alaska—Oil refinery at Kenai (N)		Asphalt and oils to make the desert	88
Fatty acid flux facilitates hot-dip		Alcohol Sept. 30	*44	bloom? (N)July 22 Coating protects weather-exposed	9.5
funning (C)	24	Alfols, synthetic alcohols, Apr. 29	7.4	equipmentApr. 15	110
Ivet eveterne ove kov to direct voute		Polyvinyl alcohol yarns—Polish process resembles Japanese (N)Dec. 23	42	Atomic Power AEC's Oak Ridge National Laboratory	
(C)Feb. 4	31	Aldehydes—Carbogen oxidation process	40	to shut down (N)	126
Aug. 19-77, Sept. 2	5.4	makes aldehydes from aromatics (C)	0.4	for other advanced reactors (N)	
(C)	10	Mar. 18 Alkylation—Cumene plant features phos-	84	July 22	84
Polycarbolic acid Apr. 29	19 76	phoric acid alkylation-flowsheet.		Atomic Industrial Forum scans nu-	34
Polycarbolic acid		Eugene GuccioneApr. 29	*92	clear outlook (N)Jan. 7 British expert predicts rapid growth	
bonds metals to plastics (C)Mar. 4 Trichloroacetic acid via new route (C)	33	High-temperature metals. Ross & Mc-		in nuclear power plants (C). Nov. 25	48
Dec. 23	28	Henry (charts & table)Nov. 25	*97	California's pioneer nuclear power unit starts up (N)Oct. 28	*82
erylies		Low-temperature metals. Abraham Hurlich (charts & tables)Nov. 25	*104	Controlled thermonuclear fusion gets	
Acrylic ester for use in industrial coatings	98	Alumina	202	boost at Oak Ridge (N)Mar. 4 Fuel fabrication and reprocessing on	52
1, 3 butylene dimethacrylate available		Australian process makes alumina from low-grade ores (C)Jan. 7	23	one site advocated (C)Apr. 15	81
in commercial quantities Mar. 18 Fiber makers ride off in all directions.	110	Polycrystalline alpha alumins cer-	20	Glass trap for nuclear wastes-Har-	*84
Frances Arne (N)Nov. 25	•52	amic called Lucalox from G-E (C) Mar. 18-79, Apr. 1		well's FINGAL project (N)July 22 Irradiation aims at chemical-process	*89
Latex-resin latexes outpacing rubber	*96	Aluminum	*44	Irradiation aims at chemical-process outlets—world conference at Salzburg, Austria (N)Aug. 19 Marine propulsion—new reactor may	
(tables) (N)June 10 Latex—self-curing acrylicSept. 16	96	Aluminum needles-plastics filler		Marine propulsion—new reactor may	-86
Resin-one-component polymer sys-		Australian process conquers iron and	*63	make nuclear snipping competitive	
temNov. 25	74	silica in low-grade ores (C). Jan. 7	23	(C)Jan. 7	28
British triumvirate forms firm to		Direct reduction process plant planned by Reynolds (C)July 22	69	Mobile energy depot to be designed for AEC. Arny (C)	81
make acrylonitrile in Scotland (C)	47	Lubricants developed by G-E can han-	0.9	AEC, Arnly (C)Apr. 15 Nuclear energy and MHD to team up?	
Apr. 29 Propylene feedstock ousts acetylene at.	47	dle aluminum (N)Mar. 18 Plants—costs of aluminum-producing	100	(N)Jan. 7 Nuclear power, direct conversion get	38
Goodrich (C)	84	plants—CE Cost FileSept. 2	120	quick scan (N)	60
Sohio denies Distillers' charges of pa-	108	Tanks-giant aluminum spheres store		Nuclear power; world conference looks	54
	117	liquid gases	*116	Nuclear safety test, called LOFT, to	3.4
dhesives		Hydrogen symposium (C)Sept. 16	69	focus on coolant circuit (N). Dec. 23	42
Epoxy adhesives for low-cost metal bonding	*112	76; (C) Sept. 30	31	Nuclear-thermionic unit aims at aerospace outlet (N)Sept. 2	42
bonding Dec. 9 Laminating material Aug. 5 Mortar—epoxy mortar makes quake-	72	Los Angeles meeting discussions Chemicals from the sea (N) May 27	*66	Organic reactors lose stature with AEC (N)Feb. 4 Outlook cloudy for joint nuclear-de-	
	5.2	Exotic new products (C) Apr. 29	52	AEC (N)Feb. 4	52
Neoprene adhesiveJuly 8	•92	Space lubes (N)May 27 Waste water renovation symposium reflects wide concern (C)Feb. 4	*74	salting plants (N)Dec. 9 Radioactive waste disposal eased by	98
Polypropylene "taffy" for hot-melt	50	reflects wide concern (C)Feb. 4	31	Radioactive waste disposal eased by	
Neoprene adhesive July 8 Polypropylene "taffy" for hot-melt adhesives Jan. 7 PVC paste developed by Britain's	52	American Institute of Chemical Engineers		calcining techniques (charts) (N) Apr. 1	*26
ICI (C)	62	ChE eduation under scrutiny at San Juan meeting (N)	136	Reactors-private owners needed. R. E.	
Resin provides water-resistant bond	106	Equipment session—panel probes buy-	140	Wilson (QED)Jan. 21	199
to polyethyleneJuly 22	•98	ers' and sellers' roles (C) May 27	5.5	Superheated steam produced in boil- ing-water power reactor (C) Nov. 11	120
diponitrile—Electrochemical route de- veloped by Monsanto will get com-		Movie to attract students to chemical	*78	TARGET project—AEC seeks big gas-	
mercial plant (C)Oct. 28	69	engineering (N)June 24	*56	cooled power reactor using thorium as fuel (N)	32

Atoms—Survey of modern chemistry. Austin & Austin, see CE Refresher;		Handbook of adhesives. Ed by Irving SkeistFeb. 18 Handbook of analytical chemistry. Ed.	231	Refractory coatings. S. W. Bradstreet (table)	77
Automation Automated pilot plant aids petroleum		by Louis Moiton And And	164	Activated carbon to be made from coal in Canada (C)Dec. 23 Graphite and carbon as engineering	26
cracking (chart & tables) (N) Apr. 29 Computers' enchantment varies among	*56	Higher education in engineering and science. Ed. by H. A. Estrin July 8 Indexes: It's what's in back that counts Dec. 23	204 126	materials. Morelli & Rusinko (tables) Dec. 23	•69
oil and chemical companies (C) Apr. 29	49	Industrial hygiene and toxicology, 2d rev. ed., vol. 2: Toxicology. Ed. by F. A. Patty & othersDec. 9	246	Carbon Black—Portable plant makes car- bon black without air pollution— Channel Black's new process (C)	
Sulfur recovered from acid gas at small Sinclair Oil plant (chart) (N) Apr. 1	*38	An introduction to electronic analogue	192	Mar. 4 Carbon Dioxide—Acetone removes carbon	
Swiss are host to automatic-control specialists (table) (N)Oct. 14	*94	Ion exchange. Friedrich Helfferich Apr. 15 Language of computers. B. A. Galler	240	dioxide in new gas-cleanup process (N)July 8 Carbon Disuifide—Fluidized system re- covers carbon disulfide at Court-	86
Coating cars by electrophoresis (C) Aug. 5 Corning bendable safety glass for 1964	43	Liquid extraction, 2d ed. R. E. Treybal Agr. 1	145	covers carbon disulfide at Court- aulds (C) Mar. 4 31 (chart) (N) Apr. 15	
Crankcase devices become official in	69	Mass transfer process calculations. Sawistowski & SmithSept. 2	156	Carboxylic acids see Acids—Neo-acids Catalysts Catalyst from Harco ups combustion	
San Francisco (C)Nov. 25 / Awards Kirkpatrick Award		Materials of construction for chemical plant. Ed. by I. L. HepnerFeb. 4 Modern chemical engineering, vol. 1:	160	efficiency (C)Jan. 21 Demet—economic studies pick best pay-	48
Nominations (N) Feb. 18 Judges (N) Apr. 1 Finalists (N) July 22 Winner: American Potash & Chem-	86 40 90	AcreavosOct. 28 Modern developments in heat transfer.	194	off for catalyst cleanup (table) (N) Apr. 1 Ferro catalyst suitable for polyure-	36
Winner: American Potash & Chem- ical (N)	*46	Ed. by Warren IbeleNov. 11 Molecular stills. P. R. Watt. Nov. 25 Multicomponent distillation. C. D.	309 162	Girdler catalyst G-66 from Cheme-	108
Market-research award won by	225	Holland	243	tron presages big savings for hydro- gen plants (C)Mar, 4-36, Mar. 18 Hungary offers catalyst labs for sale	*106 *92
former CE editor (N)June 24	*44	Gibson June 10 Physical and technical pharmacy. Ed. by H. M. Burlage & others July 22	312 193	(N)	- 02
Bacteria Bactericide	144	The physics of engineering solids. Hutchinson & BairdNov. 11 PVC technology: compounding, processing and applications. W. S. Penn.	311	Japanese catalyst, tetra-azadiene, pro- motes free-radical reactions at low	98
Bactericide, called Omadine, combats	46		310	temperatures (C)Apr. 1 Liquid hydrogen ortho-to-para con- version enhanced by new catalyst	17
Microbes plague petroleum fuels (N)	*40	Pulp and paper science and technology. Ed. by C. E. Libby. 2 vols. Sept. 16	253	Methanation catalyst. G-65, from Gir-	62
June 10	110	Residue reviews: residues of pesticides and other foreign chemicals in foods and feeds, vol. 1. Ed. by F. A. Gun-		dler	
Bagasse—Making paper from cane ba-	*74	Revolution in training: programmed	251	Organic peroxide May 13 Palladium catalysts Sept. 16	110
on New Trends in Engineering		instruction in industry. T. B. Dol- match & others	160 178	direct route from benzene to fumaric	
Materials see Materials Beer—Concentration process extended from final product to intermediates		Science, technology, and management. Ed. by Kast & Rosenzweig. June 10	, 311	acid (C)	9.0
at Canadian Breweries (C)Oct. 14 Benzene Dewar benzene has structure once con-	90	and development. Taylor & Barron	216	Steam-reforming catalyst Nov. 25 Sulfuric acid catalyst Aug. 19 Toluene-to-benzoic acid route features	
sidered impossible for benzene (C) Nov. 25 Scientific Design's benzene oxidation	43	Spectroscopy, Walker & Straw. 2 vols. Apr. 29 Technical service handbook, E. P.: Mc- Gnire.	186	Toluene-to-benzoic acid route features new catalytic system (C)June 24 Cement Automatic controls adjust cement	
process for producing phenol (C) Dec. 9 Benzoic Acid — Toluene-to-benzoic acid	85	Vectors, tensors, and the basic equa-	215	plant's flow of raw materials (C) Sept. 30-33, (C) Oct. 14 Expanding cement eliminates shrink-	
route features new catalytic system (C)June 24	35	tions of fluid mechanics. Rutherford Aris Jan. 21 Waterproofing and water repellancy. Ed. by J. L. Moilliet Sept. 2 Borle Acid—American Potash & Chem-	213	Russian concrete replaces cement with	34
Beryllium Beryllium used as high-energy in- gredient in Atlantic Research pro-		Ed. by J. L. MoillietSept. 2 Boric Acid—American Potash & Chem- ical's borate extraction process wins	164	polyester resins (C)Nov. 11 Ceramics Brittle engineering materials. D. R.	
pellants (C)June 10 EBOR (experimental beryllium oxide reactor) to be built for AEC (C)	81	CE's achievement award. C. R. Ha- vighorst (chart)	*228	Brittle engineering materials. D. R. Wilder (charts)	*209 185
July 8 Boiling—Predicting and using liquid- boiling behavior. Victor Asch. Apr. 29	68	ble in hydroxylic solventsMay 13 Boron Nitride—Conventional synthesis makes unusual refractory material	110	Lucalox — G-E's metal-like ceramic withstands high temperatures (C) Mar. 18-79, Apr. 1	*44
Engelhard Hanovia process will make	120	at Carborundum—flowsheet. J. W. Gilpin	•110	Cermets Brittle engineering materials, D. R.	
lined or coated pipe at new N. J. plant (C)Nov. 25 Explosive bonding process from Du	43	Bubble Caps—Bubble caps revisited (comments on Van Hecke article). D. J. Bergman	*91	Wilder (charts)	52
plant (C)	67	Butadiene plant makes ocean trip to	92	Chem Show—Preview of highlights, plans, exhibitors	*345
bonds metals to plastics (C).Mar. 4	33	Brazil (N)	30	"Chemical Engineering" Clark, M. E., former editor, wins mar-	
Absorption, distillation and cooling towers, W. S. Norman Jan. 21 Advanced inorganic chemistry, a comprehensive text. Cotton & Wilkinson	212	Resins—viscous unsaturated polymers Nov. 11	142	ket-research award (N)June 24 Conference on New Trends in Engi- neering Materials see Materials	*44
prehensive text. Cotton & Wilkinson Apr. 15 Boiler house and power station chemis-	242	C		Havighorst replaces Robbins as West- ern EditorFeb. 18	•6
Calculations in the paper industry.	179 255	Calcination—Nuclear-waste woes eased by calcining techniques (chart) (N) Apr. 1	*26	"Chemical Engineering Cost File" 73. Economics of long- vs. short-life materials. J. R. Brauweiler (charts)	
The case against the nuclear atom. D. B. LarsonJuly 22	193	Canada Athabasca sands—Great Canadian hits		Jan. 21 74. Multiplying factors give installed costs of process equipment. Jackson	
The chemical composition and properties of fuels for jet propulsion. Ya. M. PaushkinFeb. 18 Chemical engineers' handbook, 4th ed.	231	financing snag (C)Oct. 28 Athabasca sands—more applicants bid for rights (C) Jan. 7-21, (C) Feb. 4- 29, (C) Mar. 4	74	Clerk (tables)Feb. 18 75. New short-cut method for plant	182
Chemical reaction angineering Octave	273	29, (C) Mar. 4 Athabasca sands—new extraction routes unveiled; chance for use dim (C)	36	76. Guide to insulation costs for ves- sels. T. N. Dinning (tables)Apr. 15	
Levenspiel	160	Nov. 25 Athabasca sands—Pan American gets	48	 Electrical-equipment purchase costs. M. M. KirkJune 10 	244
Computation of multistage separation	157	approval for experimental operations (C)July 22 Cyclohexane plant uses thermal dealky-	74	78. Guides to estimating costs of plants abroad (tables)July 8	
processes, D. N. Hanson & others Jan. 7 Cost controls for industry. T. S. Du-	144	lation-flowsheet. Eugene Guccione July 22 Iron powders produced from low-grade	*112	79. Surplus inventories: liquidate or retain?Aug. 5 80. Costs for building and operating	
dick	249	ores (C)Apr. 29 Process to get pilot-plant test (C)	47	aluminum-producing plantsSept. 2 81. New ratios for estimating plant	120
Developments in inorganic polymer chemistry. Lappert & Leigh. Apr. 15	249 244	May 13 Multipurpose pipeline planned from Alberta to Vancouver (C)Oct, 28	83	costs (tables)	120
Diffusion and membrane technology, ACS monograph 156. S. B. Tuwiner June 24	159	Sulfur production—Canada soars to new world status (table) (N)Mar. 18	102	83. Comparing costs of materials for cryogenic containers (charts & ta-	
Engineering contracts and specifica- tions, 4th ed. R. W. Abbett. Nov. 25	163	Tin mining plans may launch North America's first major tin production (N)Dec. 23	*30	bles)	
Entropy. J. D. Fast Apr. 29	252 186	Uranium glut makes producers cost- wary (N)Jan. 21	62	"Chemical Engineering Plant Cost Index" (see also each issue since Feb. 18)	
ume). Ed. by D. W. Fuerstenau	215	Carbides Direct path from refractory oxides to carbides (chart) (N)Nov. 11	134	New ratios for estimating plant costs— CE Cost FileSept. 30 1962 final figures (N)Sept. 16	120 90
Aug. 19	- 20			4	

•44 •209 •345

*44 *6

	"Chemical Engineering Refresher" Statistics in chemical engineering.	Border Chemicals Co. formed by three British firms to make acrylonitrile		Chlorine Dioxide—Olin offers pulp pro- ducers route like Hooker's to chlorine	
	Statistics in chemical engineering. L. B. Andersen (tables) Pt 4 Statistical estimation gives	British CPI spending down, production	47	dioxide (C)	74
		rising (N) Feb. 18 Capital spending makes steady gains— 1964-65 outlook (tables) (N). Dec. 9 Capital spending outlook vigorous,	100	for easy moisture analysis (N). July 8 Cleaning	
	Pt 5 Tests and estimates on the statistical mean Feb. 18 159 Pt 6 Tests and estimates on the	1964-65 outlook (tables) (N)Dec. 9 Capital spending outlook vigorous,	104	Cleaner removes oil or organic coatings from metalsJune 10 Cleanser removes radioactive dust from	110
	statistical varianceMar. 18 191 Pt 7 Analysis of variance provides	(N)	64	Cleanser removes radioactive dust from machine parts	108
	techniques for rapid data reduction Apr. 15 157	Chemical and forest-products firms to be research partners (C)Feb. 18	79	machine parts	48
	Pt 8 Regression analysis correlates relationships between variables	be research partners (C)Feb. 18 Chemical outlets set LPG sales pace (N) Feb. 4	52	Process vessel cleanerJan. 21 Coal	72
	Pt 9 Multiple regression techniques	(N)Feb. 4 CPI in 1962: record sales right and left (charts) (N) Feb. 4	38	Activated carbon to be made from coal	26
	correlate experimental data June 10 223 Pt 19 Nonparametric statistics pro-	left (charts) (N)Feb. 4 CPI's 1962 record: the key to 1963— reportJan. 21	*91	in Canada (C)Dec. 23 Evaluating coals for coking (C) Nov. 25	56
	vide comparisons between distribu-	Cuba's CPI—a look behind the curtain	*98	Gasification process enhances coal's status (N)	
	Pt 11 How to apply statistics in	(N) Oct. 14 Delhi-Taylor Oil liquidation negotia-	26	Gasoline-from-coal pilot plant to be financed by Office of Coal Research	
	Pt 12 Factorial design of experi-	tions (Ĉ) Jan. 7 Diversification wanted? Try research retrieval (N) Feb. 18	100	(C)	36
	A survey of modern chemistry. Austin	Environmental health and CPI respon-	100	by Czechs (C)	117
	& Austin Atomic structure in modern chemistry	sibility. Arthur Smith, Jr. (QED) Dec. 9 Equipment buyers and sellers probe	229	costs close to those of methane re-	
	The chemical bond in molecular	their roles (N)July 8 Expansion is rampant in Deer Park,	*78	forming (C)	106
	structures	Tex. (C)	122	Britain? (N) Dec. 9 Research funds boosted, aim at pipe	
	of molecules Nov. 25 *119 The periodic law correlates proper-	equal marine shipping rates (N)	38	line gas, gasoline (C)Aug. 19 Rubber goods may offer outlet for coal fines (N)Jan. 7	44
	"Chemical Engineering Reports"	FMC Corp. will buy American Viscose		Soviet process converts coal into	76
	Analog computers—their basic roles. J. C. Phillips & others. Apr. 29 *99-122	(C) Fluor-Singmaster & Breyer will become	84	phenol-like resin (C)July 22 Coatings	10
	Basic roles for analog computers. J. C. Phillips Apr. 29 Analog components and their maintenance. James & Evans Apr. 29 101	full subsidiary of Fluor (C)Aug. 5 Forecast of chemical sales to 1967	45	Aerospace protective coatings get once- over (N)	70
	Analog components and their main- tenance, James & EvansApr. 29 101	Forecast of chemical sales to 1967 (tables) (N)July 8 Global outlook prescribed for chemical	76	Asphalt coating protects weather-ex- posed equipment	110
	Simulation of chemical reaction kinetics. W. F. Wagner Apr. 29 104 Equipment design via analog computers. R. G. E. Franks Apr. 29 108 Analysis of control methods. R. J.	firms (N)	66	Catalyzed rubber coating fights corrosionJan. 7 Cermet coatingsSept. 2	*48
	Equipment design via analog com- puters, R. G. E. FranksApr. 29 108	Growth in U.S. accelerating to 10%/yr.	122	Cleaner removes oil or organic coatings	52
	Analysis of control methods. R. J. Ruszkay	(N)Oct. 14 Growth outlook is good for chemical	106	from metalsJune 10 Copper-coating for copperApr. 29	76
	Ruszkay	securities (N)	138	Corona discharge primes surfaces for polyethylene coating (C)Nov. 11 Elastomer coating protects asphalt	115
	H. G Garner	Brown & Root, Inc. (C)Jan. 7 Humble Oil buys extensive Tidewater	23	May 27	84
	CPI's 1962 record: the key to 1963 Jan. 21 *91-102	Oil facilities (C)Dec. 23 Israel's chemicals loom big in national	28	Electrophoresis may open new markets for coating materials (C)Aug. 5	43
	Evaporation. F. C. Standiford, Jr. (ta- ble) Dec. 9 157-176	economy (map) (N)Jan. 21 Mexico's CPI will get boost from "Buy	*50	Enamel resists high temperatures, salt spray corrosion	66
	Evaporation. F. C. Standiford, Jr. (table)	Mexican" mandate (N)Oct. 28 Nuclear Fuel Services, joint venture of	82	ing coated pipe gets N. J. plant (C)	
	What's available	W. R. Grace and American Machine & Foundry, plans first private nuclear-fuels reprocessing plant (N)		Epoxy coating cures to tough finish on	43
	How to select centrifugal pumps H M	Apr. 29	*68	damp surfaces	•72
	Pollak (charts & tables)Feb. 4 *81-96 Information retrieval (charts & tables)	Overseas enterprises—CPI problems in the emerging countries. G. C. Jones		tect refractory metals (C). June 24 Flux facilitates hot-dip tinning (C)	40
	Jan. 7 *73-88 Improving personal filing systems; starting a personal file; how to	Overseas enterprises—CPI sets pace for	*69	Foamed plastisol Apr. 1	*46
	use concept coordination. Ralph	Phillips Petroleum withdraws from	84	Glass coating reflects solar energy Oct. 14	112
	How to put key-concept indexing to	joint petrochemical venture in Algeria (C)	21	"Glow-discharge polymerization" puts organic film on metal (chart) (C)	-
	Ion exchange—What's new, practical,	June 10	102	Sept. 2 Industrial finishes: outer calm, inner	27
	important in ion exchange. A. W. Michalson (charts & tables)	Royal Dutch Shell-Montecatini link-up coming? (N)	36	boil (tables) (N)Feb. 18 Inorganic coating called Ceram-ite	*88
	Liquid-liquid extraction. Oberg & Jones	British tire makers (C)Apr. 1	24	Nov. 25 Inorganic coatings protect plastic foam	76
	(charts & tables) July 22 *119-134 Managing engineering projects. J. M. McLellan May 13 *157-172 Materials handling and bulk packaging.	A. O. Smith terminates process equipment business (C)Feb. 4	36 28	Nov. 11 Latex coating for paperJune 10	
	McLellan May 13 *157-172 Materials handling and bulk packaging.	ment business (C)Feb. 4 Soviet CPI goals for 1963 (N)Apr. 1 Soviet CPI—how the industries shaped	89	Paints-protective coatings. F. R. Charl- ton (tables)	
	Sept. 16 *157-180	up in 1962 (table) (N)Mar. 18 Soviet Union's CPI heads for big doings Dec. 9	102	Why paint?	
	Industrial trucks Sept. 16 158 Cranes Sept. 16 164	SOCMA gathers fcreign-trade data (N)		When to paint	
	Conveyors	Sperding for overseas facilities will	32	Pipe coating for gas-transmission lines	106
	Industrial packaging Sept. 16 178 Education and philosophy Sept. 16 179	continue to rise (C)Sept. 16 Westinghouse negotiating to buy Con-	71	Polyester coatingJan. 7	86
	plants and facilities Apr. 15 163-171,	trols Div. of Hagan Chemical & Controls, Inc. (C)Apr. 29	49	Polymer coating battles pipeline corresionFeb. 18	
	Oct. 28 127	Chemicals Brine pushed up by geothermal wells		Polyvinyl acetate resin protects against	
	Technology—14th inventory of new processes and technology. Jan. 21 107-114 Technology—15th inventory of new	may yield chemicals (C)June 24 Chemicals from oil: an economic im-	35	Refractory coatings. S. W. Bradstreet (table)	*64
	processes and technology. Aug. 5 105-112 Water: supply, treatment, disposal, re-	perative, J. E. Wood (QED)Mar. 18	233	(table)	
	covery (charts, tables, maps)	The man-made chemical elements be- yond uranium. G. T. Seaberg (QED)	107	for molybdenum	*58
	Planning the plant water supply. W. F. GuytonJune 10 170 Design and operate for water econ-	Sales forecast to 1967 (tables) (N)	197	Stainless-type steel coating applied to carbon steel by new Du Pont process	
	Design and operate for water econ- omy, Partridge & Paulson. June 10 175	July 8 The sea as a source of chemicals— ACS	76	(C)Apr. 15	84
	omy. Partridge & Paulson. June 10 175 Reusing municipal waste water. T. F. Sullivan	symposium (N)	*66	Tank gets coating of Tefion TFE ename!	*206
	Water treatment for plant use. M. E. Gilwood June 10 183	Benzene structure considered impos- sible found in new Dewar benzene (C)		Tantalum—high-vacuum line success- fully sputters tantalum at Western	
	Cooling with seawater. Gus Heine- mann	Nov. 25	45	Electric (N) May 13 Teflon plating process puts thin coating	+98
	Control of water pollution, C. F.		217	on metal (C)July 22 Tungsten carbide alloy in powder form	71
	GurnhamJune 10 190 Desalting of seawater. D. F. Othmer	A survey of modern chemistry—CE Re- fresher. Austin & Austin		Oct. 14	110
	Advanced waste treatment. Louis	Atomic structure in modern chemistry	*97	Vinyl coating	58
	KoenigJune 10 ?10 The case for evaporation suppression.	The chemical bond in molecular structuresOct. 28		Cobalt—Radioactive cobalt-80 via much faster route (N)Aug. 5	64
,	V. K. La MerJune 10 213	Chemical bonds explain formation of molecules		Coke and Coke Products Coke bed to serve as sink for sulfite	
	Allied Chemical acquires Times Tower.	The periodic law correlates proper-		slop? (N)	82
	NYC. (N)	ties of the elementsDec. 23 Chlorine	87	Electrodes from fluid-bed coke (C) Nov. 11	122
	tions to buy Cosden Petroleum (C) Mar. 4 33	Hydrochloric acid glut—chlorine: core and cure of HCl's woes. Frances Arne	***	Petroleum coke yields high carbon foundry coke via Pacific Clay proc-	
	Bakelite Xylonite Ltd. formed—joint plastics venture of Union Carbide and Distillers Co. of London (C)	(N) Oct. 28 Kellogg's catalytic route to chlorine	*76	ess (C)	76
	Distillers Co. of London (C) Jan 21 46	via HCl (C) Apr 98	5.4	now process (C) Nov. 11	9.00

Combustion	Overseas plants-CPI problems in the	Materials for water desalting plants.
Catalyst ups combustion efficiency (C) Jan. 21 48	emerging countries. G. C. Jones (table)	R. E. Moore Sept. 30 *124, (table) Oct. 14 224
Flameless combustion of waste plant sludge to get fifth U.S. plant (C)		Monolithic tank linings excel under severe conditions. W. A. Severance
Water desalting by submerged combus-	Frances Arne (N)Sept. 16 *84 Scheduling — Control-Operation Tech-	New corrosion test for stainless. May 13 *204
tion—new method described at UN conference (C)	nique: new approach to project scheduling. Mattozzi & Lipinski (charts & tables)Feb. 18 *135	Nickel plating protects foods, chemi- cals from metallic contamination.
Commercial Chemical Development Assn. —Global outlook prescribed for chem-	Vinyl producer sets up application safe-	R. V. Hughson (table)Apr. 15 *190 Protective coatings. F. R. Charlton (tables)Oct. 28 158, Nov. 25 *140,
ical firms (N)	guards (N)Oct. 28 82 Containers	
paction to make nuclear reactor fuel	Bulk shipping and containers—Materi- als handling report. Ayers & Rhodes	Reinforced plastics curb corrosion, J. P.
(C)	(chart & table)	Edwards Dec. 9 206 Sulfur-Combating hot sulfur-bearing gases. R. V. Hughson (table) June 24 *138
tions. J. H. Mallinson (charts & tables)	tainers (charts & tables)—CE Cost File	Cost Estimating see CE Cost File; Costs; Economics
Compressors	Controls Adjustable restriction accurately con-	Conts
Bigger ammonia plants suggest com- pressor shift (N)Aug. 19 *88	trols flow. W. H. Gries (P.N.) Jan. 21 *134	CE Cost File see "Chemical Engineer- ing Cost File"
"Mixed" compression—new trend. R. V. Endres (chart) Sept. 16 *185	Analog analyzes control program for distillation column. R. J. Ruszkay Apr. 29 *112	CE's new index shows plant cost trends. Arnold & Chilton (tables)Feb. 18 143
Water-lubricated compressor cuts haz- ards in oxygen service (C)Jan. 21 43	Analog simulation center - graphic	Contract maintenance—a fresh look. Herbert Popper (tables)Apr. 1 104
Computers Analog center at Du Pont adds extra	panels use real electronic controllers (N)	Engineering firm cuts costs by charging for preparing bids (C)Apr. 1 17
touch of realism (N)Mar. 4 *50 Analog computation course offered by	analyzers. Escher & Fraade (charts)	Guidelines for estimating profitability. Jack Ross & othersAug. 19 145
electronics firm (N)Sept. 2 48 Analog computers—their basic roles.	Sept. 30 89 Cement company uses automatic con-	How to scale up cost estimations. Hol- land & Brinkerhoff (tables)Feb. 4 97
J C. Phillips & others (charts & tables)	trols to adjust flow of raw materials (C). Sept. 30 33, (C) Oct. 14 83	Inert-gas systems. E. J. Funk, Jr. (charts & table)Oct. 28 *117 Project appraisal—techniques for ap-
tables)	Computers see Computers Direct digital control concept accepted	praising afternatives, H. H. Street
J. C. Phillips	by instrument vendors (C)Oct. 28 69 Level controller for powders. L. M.	Spray dryers—design and costs. D. W.
Simulation of chemical reaction ki- netics, W. F. Wagner Apr. 29 104	Polentz (P.N.)	Belcher & others (table)Oct. 14 *201 Water—Design and operate for water
Simulation of chemical reaction kinetics. W. F. Wagner	Nuclear gaging system solves level-	economy. Partridge & Paulson (charts)June 10 175
Analysis of Control methods, R. J.	control problem (chart) (P.N.) July 8 160 Radioisotopes aid process control at	Cotton—Deferred curing—cotton's pitch for larger wash-and-wear market (C)
Simulating steady-state balances	sulfuric acid plant (N)Sept. 30 54 Trouble-shooting the uncontrolled vari-	Cottonseed Processing Oct. 28 72
H. G. Garner	ables. A. H. Bobis (charts)Mar. 18 *185 Unit control systems—a new concept.	Cottonseed meal quality improved by mixed solvent extraction process (C)
Analog device provides better control	E. R. Forman (charts)Aug. 5 *93	Mar. 18 86 Mexican plant makes the most of cotton
for continuous pulp digester (C) Apr. 15 79	What's ahead in process control. A. F. Lee June 24 *99	seeds - flowsheet. P. J. Brennan
Cement plant pairs computer and X-ray analyzer to adjust flow of ingredients	Conveyors—Materials handling report	Couplings Jan. 7 *66
(C)Sept.30-33. (C) Oct. 14 83 Chemical and oil companies' reactions	Ayers & Rhodes (charts)Sept. 16 *166 Plastic pipe protects conveyor-belt	Quick-disconnect couplings save gas- metering costs (P.N.)July 8 *162
to computers (C)Apr. 29 49 Computer aids testing of solid propel-	Plastic pipe protects conveyor-belt rollers (P.N.) Mar. 18 *206 Salt slinger slashes ship-unloading	What you may not know about shaft couplings
Computer sets up educators' confer-	time (N)	Cranes—Materials handling report. Ayers & Rhodes
ence (N)	Cooling Towers—Biocide fights cooling- system algae, slimeFeb. 4 60	Creativity Channeling creativity. Robert Milton
Thorne & Wise (charts & tables) Apr. 29 *129	Copper Choosing copper alloys for heat-trans-	(QED)
Design program for vaporizers and re- boilers. J. P. Fair (tables)Aug. 5 *101	fer equipment. C. L. Bulow (chart &	(QED)
Direct digital control—chemical firms press for progress (C)June 10 88	table)	mermanJuly 22 *152 Cryogenics
Direct digital control concept accepted by instrument vendors (C)Oct. 28 69	Copper alloy	Air Products cryogenic separation proc- ess for making synthetic methane (C)
Encapsulated modules seek larger share of analog on-stream control (C)	oxidation resistance (C)Nov. 11 117	Apr. 1 19 Air separation plants get new look-
Sept. 2 25 Minneapolis-Honeywell computing cen-	Refining process from Czechoslovakia uses ammonia to improve scavenging	flowsheet. Eugene Guccione. Sept. 16 *150 Costs of materials for cryogenic con-
ter boasts digital-analog duo (N)	of oxygen (C)Aug. 5 48 Correlations	tainers (charts & tables)-CE Cost
Modular process computer-control sys-	Improved least-square method for cor- relating nonlinear data. Smith &	Cryogenic refrigerator developed at
Oil refining adds three more computers	TaoOct. 14 193 Multiple regression techniques correlate	Cryogenic washing scrubs hydrogen for
(N)	experimental data. L. B. Andersen (tables)June 10 223	rockets—flowsheet. Eugene Guccione May 13 *150
nates mill problems (C)Aug. 5 45 Papermill operation: where do comput-	Nonparametric statistics provide com- parisons between distributions. L. B.	Helium separation plant—world's larg- est cryogenic facility — flowsheet.
ers fit? (N)Sept. 2 *44 Process control—what's ahead. A. E.	AndersenJuly 8 139 The periodic law correlates properties	Eugene GuccioneSept. 30 *76 Liquefaction plant puts neon among
LeeJune 24 *99 Pulp plant to get closed-loop computer	of the elements-CE Refresher, Aus-	top cryogenic fluids—flowsheet. Eugene Guccione
Schools act to meet computer-created	tin & Austin	Metals for low-temperatures. Abraham Hurlich (charts & tables)Nov. 25 *104
Teaching engineers about computers	Predicting consecutive reactions, J. S. Ratcliffe (charts)	Specifications focus on cryogenic ship-
J. P. Laird	Regression analysis correlates relationships between variables. L. B. Ander-	ments (N)
Concentration—Delta equations speed up	sen (charts & tables)May 13 173	on stream at Liberal, Kan. (C) Aug.19 82
concentration calculations. Leonard Shapiro (table) (P.N.)Oct. 28 150		Crystallization Controlled crystallization process yields
oncrete Cement that expands as it hardens	brown & Barbis (tables)Apr. 29 *148 Anodic protection against corrosion.	strong phosphoric acid (chart) (N) July 8 76
eliminates shrinkage (C)Sept. 30 36 Epoxy mortar called ThreadlineJan. 7 52	Sudbury & Locke (charts & tables) Nov. 11 268	Fractional-crystallization process re-
Russian concrete uses polyester resins instead of cement (C)Nov. 11 120	Casebook of a corrosion detective. T. M. Krebs	covers pure p-xylene from mixed xylenes (chart) (N)Aug. 5 *62
Waterproofing agent called Surtiseal Jan. 7 50	Coating battles pipeline corrosion	Texas Instruments have optimum
Wire filling makes stronger concrete	Feb. 18 *104	properties (C)June 24 40 Crystals—Czech moving-wire device cuts
ondensation-Equalizing line improves	E. G. Fochtman & others (chart)	crystals carefully (N) Sept. 16 92 Cuba—Pulling back the curtain on
condenser operation. Hans West- phalen (P.N.) Oct. 28 *150 emstruction	Controlling corrosion in carbon-steel tubes. H. F. Hinst (charts)Jan. 7 *110	Cuba's CPI (N)Oct. 14 *98
Aluminum-producing plants - building	Corrosion inhibitors, May 27 82, Aug. 5 72 Corrosion inhibitors for petroleum in-	Cumene—World's largest cumene plant features H ₃ PO ₄ , alkylation—flowsheet.
and operating costs—CE Cost File Sept. 2 120	Corrosion-resistant metals, I, W.	Eugene GuccioneApr. 29 *92 Cyclohexadiene — French cyclohexadiene
Butadiene plant makes ocean trip to Brazil (N)July 22 92	Gleekman (charts)Nov. 11 *217 Cracks under the microscope. D. T.	pilot plant based on new diolefin technology (C)July 8 68
CE's new index shows plant cost trends. Arnold & Chilton (tables)Feb. 18 143	Williams	Cyclohexane — Canadian plant uses thermal dealkylation—flowsheet. Eu-
Costs—short-cut method for plant costs —CE Cost File (charts)Mar. 18 208	effects of wall temperatures. Berg- strom & Ladd (charts & tables)	gene GuccioneJuly 22 *112
Modules, big and small, hike engineer- ing efficiency at Du Pont (N). Jan. 21 *54	FEP-Teflon linings for vessels vie with	Cyclo-octadiene — Montecatini uses cy- clo-octadiene as EPR component,
Managing engineering projects—report. J. M. McLellanMay 13 *157	glass (C)Sept. 30 31 Glass reinforcement for plastics affects	produces sulfur-curable terpolymer (C)
New ratio for estimating plant costs (tables)	Glass reinforcement for plastics affects corrosion. Feuer & Torres (chart) July 22 168	Cyclopentadiene — Hungarian route to cyclopentadiene (C)Sept. 2 32
120		

D		Auto fumes—exhaust afterburner of- fers added competition for catalytic		Profitability-guidelines for estimating profitability. Jack Ross & others	
Design Bionicslearning-from-life approach		devices (C)Jan. 21	41	Profitability-why profitability esti-	145
to system design (QED)June 10 Equipment design via analog comput-	282	Smog-Los Angeles seeks to force	*90	mates go wrong—CE Cost File (tables)Oct. 28	154
equipment design via analog comput- era R. G. E. Franks Apr. 29 Modules, big and small, hike engineer- ing efficiency at Du Pont (N) Jan. 21 Monsanto's Chocolate Bayou plant re- flects new thinking (C) Jan. 7 *86,	*54	power plants to use natural gas in winter (C)	36	Project appraisal—techniques for ap- praising alternatives, H. H. Street (charts & tehles)	*121
Monsanto's Chocolate Bayou plant re- flects new thinking (C) Jan. 7 *36.		Aso dve synthesis—flowsheet Eugene	*138	praising alternatives, H. H. Street (charts & tables)	144
(N)Jan. 21 Nomograph sizes catalyst-bed support	•58	Guccione	104	May 13 Rate of return calculations simplified	9.9
grating. A. D. Scheiman (P.N.) Mar. 18	204	Polypropylene fiber from U. S. Rubber	112	with new chart. Royes Salmon Apr. 1	*79
Start over again—remarks by P. F. Drucker (QED)Feb. 4	142	accepts conventional dyes (C) June 24-40, July 8	*94	Raw materials: will U.S. have enough in 2000? (tables) (N)Apr. 15 Technology vs. jobs. G. H. Hildebrand	88
ABS removed by reaction with another detergent—W. E. Samples' method		Polypropylene yarn dyesApr. 29 Sodium borohydride solution aids vat	58	Water-desalting study negs hig-plant	230
ABS removed from sewage by liquid	86	dyeing of cotton	**	economies (table)Oct. 14 What's ahead for business?—Mc-	102
ion-exchange system (C) Sept. 2	27	stage processes with dynamic pro- gramming. Mitten & Nemhauser (charts & tables)Oct. 14	•195	economies (table)Oct. 14 What's ahead for business?—Mc- Graw-Hill's Dept. of Economics takes a look (N) Feb. 18-94, (N)	
ABS water pollution—ACS meeting discusses remedies (C)Feb. 4 Biodegradable detergents' big debut	31	_		What is profit? Henry Ford II	96
nears—producers' plans, methods (chart) (N)Aug. 5 Biodegradable surfactant called DN-	•52	Economic Evaluation see Economics		(QED)	
65	110	Mar 4-198 Mar 18-294 Apr 1-162		engineer	7
gents at Du Pont (N)May 27 Cleanser removes radioactive dust	78	Apr. 15-283, Apr. 29-222, May 13- 287, May 27-215, June 10-359, June 24-197, July 8-233, July 22-227, Aug. 5-189, Aug. 19-252, Sept. 2-191, Sept.		waste programsJune 10 Maintaining human assetsJuly 8	7
from machine partsMar. 18	108	24-197, July 8-233, July 22-227, Aug. 5-189, Aug. 19-252, Sept. 2-191, Sept.		New trends in engineering materials June 24	7
SCAT, degrades hard detergents (C) Sept. 30	38	16-301, Sept. 30-175, Oct. 14-327, Oct. 28-229, Nov. 11-443, Nov. 25-195, Dec. 9-291, Dec. 23-167		Pro bono publicoApr. 29 A refreshing decadeSept. 30 Under the double standardFeb. 18	7
Isosiv and Molex processes provide paraffins for soft detergents (C) Sept. 16	69	Economics Business orientation in the plastics in-		Who should own patents resulting from	9
Monazolines detergents and anti- static agents	76	dustry. R. L. Schuyler, Jr. (QED) Sept. 2	145	government research?Aug. 5 Your stake in the sea	7
(chart) (N)Apr. 1	34	Canada soars to new status in world sulfur (table) (N)Mar. 18 Capital spending outlook vigorous,	102	ASEE plans long-range study of engi-	
"Soft" detergents promised by makers as Congress probes water pollution		McGraw-Hill survey finds (tables)	64	neering needs (N)	
(C) June 24 Surface-active agent requires no foam	33 112	(N)	45	electronics firm (N)Sept. 2 Austrian school for plastics technology	
stabilizersJune 10 Will research or legislation solve problem of hard-to-degrade deter-	112	Catalyst cleanup's best payoff (table)	36	(N)	136
gents? (C)	82	(N)	106		
mond plant in Eire is Europe's first (C)	86	Chemical manufacturers gather for- eign-trade data (N)Apr. 1 CPI in 1962; record sales right and	32	programs (N)	110
Fouled diethanolamine solution comes		left (charts) (N)Feb. 4	38	EJC findsJan. 7	102
clean at Tidewater Oil (chart) (N) Mar. 4 Tidewater Oil's method for treating	40	CPI's 1962 record: the key to 1963— report	*91	Engineers to educators: give students more program options (C)Aug. 5	43
Tidewater Oil's method for treating contaminated DEA (C)Jan. 21 Diffuser—continuous sugar-cane diffuser	48	Chemical securities' growth outlook is	76	Focusing on the engineer supply— AlChE movie to attract students (N)	*56
scaled up from pilot unit (C) July 8	70	good (N)	138	(N)June 24 Ford Foundation fund lets engineering professors go on leave for stint in	
Diffusion—Thermal diffusion recovers helium-3 isotope (N)Nov. 25	*64	gains—outlook for 1964-65 (tables) (N)	104	professors go on leave for stint in practice (C)	
Dimethyl maleate commercially availableOct. 14 Disaster Control	110	spending plans (C)	81	Attacking technical obsolescence. M. W. Kriegel	134
Gulf Coast cold weather precautions pay off (N)	•48	proposed capital expenditures. Thorne & Wise (charts & tables)		Training engineering technicians. G. L. BeiswingerMay 13 Teaching engineers about computers.	*191
ready (C)	90	Apr. 29 Cuba'a CPI-a look behind the curtain	129	J. P. Laird	*140
Distillation Analog analyzes control program for		(N)	•98	BrennanJune 24 MIT's new program to help engineers	121
distillation column. R. J. Ruszkay Apr. 29 Bubble caps revisited (comments on	•112	tionary economic change. J. J. Powers, Jr. (QED)Mar. 4 Doing business with a revolution. J. T.	146	combat obsolescence (C)May 13 Materials handling education—Mate-	81
Van Hecke article). D. J. Bergman Mar. 4	*91	Connor (QED)Sept. 16 Ethylene faces healthy but competi-	228	rials handling report. Ayers & Rhodes	179
Desalting water by thin-film vapor compression offers savings (chart)		tive future (chart & table) (N) Mar. 18	96	Need more teachers. R. A. Morgen	96
(N)Apr. 15 Designing many-plate distillation col-	96	Evaluating R & D projects. A. J. Weinberger (charts & tables)		Pennsylvania votes for loans to college	
umns F. A. Holland & others (charts)	*153 252	Improving R & D batting average Oct. 28 How to estimate required invest-	123	students (C) Dec. 23 Pollution studies—Drexel will offer curriculum leading to M. A. degree	28
Correction	200	Calculating manufacturing costs	113	(N)	96
Estimate number of plates from boil-	241	Global outlook prescribed for chemical	81	offers first B. S. in Systems Science	34
ing points. L. S. Bitar (P.N.). Aug. 5 Pressure monitoring of packed towers.		Government-industry relations—Dialogue for the deaf. L. T. Johnston	66	Ready to do engineering in the 21st century?	
C. W. Yost & others (P.N.) Nov. 25 Tray design improvements lead Linde into selling distillation systems (C)	-130	(QED)	154	Rensselaer sets stiffer requirements for engineering degrees (C)May 27	55
Drugs Dec. 9.	83	rain. (QED)	215	The universities and the oil companies. L. A. Kimpton (QED)Jan. 21	
Olin Mathieson denies charges of kick- backs on foreign-aid sales (C)		land & Brinkerhoff (tables)Feb. 4 Hydrochloric acid—new outlets easing	97	What's behind declining engineering enrollments?	
Prolonged-action capsule (QED)	86	glut. Frances Arne (tables) (N) Oct. 28	•76	Where do ChE's come from? — states, schools, C. L. Mantell (table)	
Oct. 14 Steroids produced wholly synthetically by Wyeth (C) Sept. 16	255 76	Israel's chemicals loom big in national economy (map) (N)	•50	July 8 Elastomers	
by Wyeth (C)Sept. 16 Dryers Specifications—Aids to dryer selec-	10	Materials—long-vsshort-life materials —CE Cost File. J. R. Brauweiler	128	Fluid, poured-in-place rubber gasket May 13	*110
tion. N. H. Parker (charts) June 24	•115	(charts)Jan. 21 Nitrogen goods flourish in world trade (N)Apr. 15	94	Orofil—acrylic elastomer fiber will compete with spandex (C). June 10	81
Spray dryers—design and use, D. W. Belcher & others		No future in status quo. C. C. Schulze (QED)July 8	195	of rubber-modified polystyrene	
Principles and applications. Sept. 30 Design and costsOct. 14		Overseas chemical facilities—U. S. will spend more in 1964 (C)Sept. 16	71	Silicone elastomerDec. 23	50
Orying Chlorine plant uses plastic mist-		Overseas enterprises—CPI problems in the emerging countries. G. C. Jones		Sprayable urethaneAug. 5 Electricity	*70
eliminator		Overseas enterprises—CPI to set pace	*69	Corona discharge primes surfaces for polyethylene coating (C)Nov. 11	115
Dust and Fume Handling Air pollution — federal action likely?		for U. S. investments (tables) (N) Oct. 28	84	Desaiting-and-power plant proposed for Key West, Fla. (N)July 8	74
(N)Feb. 4 Air pollution—how to get the most	46	Overseas enterprises—Estimating costs of plants abroad—CE Cost File	100	Direct conversion, nuclear power get quick scan at power conference (N)	60
from dust control systems. Yocom & Wheeler (charts & table)	*****	(tables)	168	Electrodes from fluid-bed coke (C)	199
June 24	126	(charts)Sept. 16	181	Nov. 11	122

Fuel cells see Fuel Cells High-intensity-arc process yields pur carbides and refractory metals (C	е	Rocket engine—plastic-lined rocket runs "cool" (C)Jan. 21 48	Centrifuges Aug. 19 °112, Oct. 28 °104 Dec. 9 °118
Apr. 1 Ion-implantation process converts ligh	5 86 t	Rocket engine—plastic-lined rocket runs "cool" (C) Jan. 21 48 Entrainment—Centrifugal pumps and entrained-air problems J. H. Doo- lin Jan. 7*103 Epoxidation—Solvay's continuous process	Centrifuge, continuous treats solids gently
directly into electricity (C)Apr. Japan's Yagishita has a miniature hermetically sealed lead-acid storage	0	uses concentrated peracetic acid (C) Apr. 1 19	Centrifuge, solid-bowl June 10 *302 Chiller sprays large uniform droplets July 22 *102
cell (C)Aug. 19 Superconducting magnet enhance MHD generator at Westinghouse (N)	9 77 8	Equilibrium Analog simulates steady-state bal- ances. H. G. GarnerApr. 29 *116	Chromatograph—instrument package adapts chromatograph for control May 13 *114
Transformer—now: a direct-current transformer (C)	8 *96 t	Equilibrium data for argon, helium, methane in ammonia. Isaacson & Viens (charts) (P.N.)Jan. 21 136 Phase equilibria—Schweitzer & Wales	Chromatograph, processJune 10 *293 Classifier, centrifugalNov. 11 *150
Anodic protection against corrosion		(charts & tables)	Compressor, air Mar 18 *242
Sudbury & Locke (charts & tables) Nov. 13 Electrochemical route to adiponitrile	268	Phase rule and equilibria relations May 27 *117 Equilibria in one-component systems	Compressor, diaphragm Feb. 18 *112 Compressor, rotary Dec. 9 *239 Compressor, world's largest Sept. 2 *60
Electrochemical route to adiponitrile gets commercial plant (C)Oct. 28 Electrolytes—PolyelectrolyteOct. 28	94	June 24 *111 Behavior of one-component systems July 22 *141	Computer control systemAug. 5 *78 Computer/controllerOct. 14 *118 Computer, digitalMay 13 116
Electron gun—G-E's "cold cathode" gun may find chemical technology uses (N) Jan. 21 Electronics—"Molecular electronics"	4	Equilibria in two-component systems Aug. 19 *167	Control system—Instrument module Dec. 23 *56
Electronics—"Molecular electronics" yields miniature circuits (N). Nov. 11 Electrophoresis	*132	Phase equilibria in binary systems Sept. 16 *187 Vapor-liquid equilibria — predicting	Controller, corrosion Apr. 15 221 Controller, indicating Dec. 9 238 Controllers, level. Jan. 21 *206, Mar. 18 *116, *238; Nov. 11 *146
Coating markets may gain through use of electropheresis (C)Aug. 5	43	nonideal behavior. E. D. Oliver Apr. 29 123	18 *116, *238; Nov. 11 *146 Controller, pH—dual-dialJuly 22 *104 Controller, pneumaticJuly 10 *296
Coating process applies thin Teflon plating on metal (C)July 22 Employment	71	Air-pollution control systems—how to get the most efficient operation. Yocom & Wheeler (charts & table)	Controller, pressure Sept. 2 *62 Controller, setpoint Dec. 9 *234 Controllers, temperature Jan. 21 *204
Demand for engineers rose during 1962	118	Yocom & Wheeler (charts & table) June 24 *126 AIChE equipment session probes buy-	Controllers, temperature. Jan. 21 *204 Mar. 4 *68, *154 Conveyor
How to find that better job D E	100	ers' and sellers' roles (C) May 27-55, (N)July 8 *78 Costs—factors give installed costs of	
Kaldenberg Dec. 9 The job outlook—1964. R. A. Labine (charts & table) Nov. 25	*124	process equipment—CE Cost File. Jackson Clerk (tables)Feb. 18 182	Coupling Aug. 19 *114 Cyclone, liquid Nov. 25 *86 Cyclone modified for pipelines Apr. 15 *112 Defibering machines. May 27 *175
What is your chance for promotion? Conrad Berenson		Design equipment via analog computers, R. G. E. Franks	Deflaker May 27 *92
Encapsulation	*176	Electrical-equipment purchase costs— CE Cost File. M. M. Kirk. June 10 244 Evaporators—Evaporation report. F. C.	centrifugal force June 10 *114 Densitometer, gas Sept. 16 *106 Detector, combustible-gas July 8 *98 Detector, gas leak Get 14 *985
Epoxy compound for encapsulating re- wound motorsJan. 21 National Lead process forms polymer	72	Standiford (table)	Detector metal May 97 *99
directly on surface of fibers, other materials (C)July 8		Ion exchangers—Ion exchange report. A. W. Michalson (chart & table) Mar. 18 *169	Detector, moistureJune 24 *68 Detector, sugarMar. 18 242
British expert looks at future needs (table) (N)	32	Japanese machinery will be used in Sekisui's U.S. plant (C)Feb. 18 84	Distillation system Apr. 29 * 784
-CPI review and forecast report Jan. 21	*95	Liquid-liquid extraction equipment se- lection—Liquid extraction report. Oberg & JonesJuly 22 *125	Drum lifter
Engineering Blological parameter. D. W. Bronk (QED) Dec. 9	233	Multiwall vessels made by new layer- ing technique at Struthers (C) June 24 35	Dryer, compact Mar. 18 *116 Dryer, drum Nov. 25 *78 Dryer, single drum Sept. 16 *104
(QED) Dec. 9 Engineering and public affairs, C. E. Reistle, Jr. (QED) Feb. 18 New engineering society debuts (N)		Plastic—Selecting plastic equipment for chemical plants. H. D. Barton Aug. 19 *188	Electronic device locates trouble in
What was 1961-1962's major Ch. E.	106	Propeller mixer selection. A. P. Weber (charts & tables)Sept. 2 *91	control loops
achievement? (N)Feb. 18 Engineers California—pinpointing the big influx	86	Pulverizer—vertical impact palverizer reduces hard material by autogenous grinding (C)	Evaporator, thin-film, can produce dry powders
of engineers (map)Jan. 21 Cost engineers discuss marketing, com- petitive bidding (C)Aug. 19	126 79	Pumps—Buying chemical pumps. T. E. Johnson	Evaporator, thin-film, cuts processing time
Distant side to ease engineer shortage?	99	refrigeration systems. E. K. Tanzer (charts & tables) June 10 *215, June 24 *105	Fan, plasticJune 10 *116 Fan, vaneaxialOct. 14 *263
Education for present and future to get study (N)	40	Reinforced plastic equipment resists corrosion. J. P. EdwardsDec. 9 206	Feed system meters solids against high pressure
Enrollments take another din EJC	118	A. O. Smith terminates process equip- ment business (C)	Feeder, belt
Focusing on the engineer supply—	200	Specification guides. N. H. Parker (charts) Mixers	Feeder, dry June 10 *118 Feeder, dry—gravimetric Sept. 2 *153 Feeder, fine-powder July 22 *106 Filter
AIChE film woos students (N) June 24 Gripes—CE asks readers: What's your	*56	Dryers June 24 *115 Evaporators July 22 *135 Selecting the best vendor Aug. 19 *161	Filter-adsorption medium Sept. 16 104
gripe? Mar. 18 CE readers voice gripes (chart) Aug. 5	198	Spray dryers—design and use. D. W. Belcher & others Sept. 30 *83,	Filter, bantamApr. 29 *177
How much is a P.E. license worth?— NSPE survey (charts & table)	*108	Oct. 14 *201 Vaporizer and reboiler design. J. R. Fair (charts & tables) July 8 *119,	design slashes size
It pays to be your own boss—NSPE survey (chart) (C)Aug. 5 It's time to self-perpetuate. C. A.	50	Equipment News	
Chayne (QED)	230	Activator, bin	Filter, membrane Aug. 19 *204 Filter, pressure Aug. 5 80 Filter, process July 8 *100
er table)	173	Actuator, electric valveJune 24 *152 Actuator, lever Apr. 1 *135	Filter, pressure Aug. 5 80 Filter, process July 8 *100 Filter, reversible-cake Jan. 7 *134 Filters, rotary vacuum, feature modular design Sept. 16 *102
Q&A about engineering registration exams	96	Actuator, valve Oct. 14 *270 Analog/digital modules May 13 *116 Analyzer Apr. 1 *62 Analyzer, boiling-point May 13 *118	Fittings, compression Aug. 5 *80
ChE's Dec. 23 Reference-libel suit settled for \$15,000	96	Analyzer, chromatographic Sept. 16 *104	Flow regulator/indicator Aug. 19 110 Flow meters Mar. 18 114 Foy. 25 80
(C) Mar. 18 Rensselaer sets stiffer requirements for engineering degrees (C) May 27	55	Analyzer, gas Dec. 23 123 Analyzer—Mass analyzer designed for on-line control Sept. 2 *58	Flowmeter, mass Mar. 4 *152 Flowmeters, turbine Apr. 1 *130
Salaries see Salaries "Shortage" cries heard again (chart) (C)June 10	83	Analyzer, miniature Feb. 4 *68 Analyzer, moisture Mar. 18 *112 Analyzer, oxygen Feb. 4 *64	Flowmeters, ultrasonicJan. 7 56 Sept. 30 66
Technicians are helpful but cost a lot to train (C)Dec. 9	83	Analyzer, particle-sizeJan. 7 *138 Analyzer, pour-pointNov. 25 *158 Analyzer, turbidityFeb. 4 *155	Flowmeter, wide-rangeMar. 4 *66 Fractionator grids slash pressure-drop Apr. 29 *80
What industry expects of the chemical engineer. Mott Souders (QED) Feb. 4	144	Radio evetem boosts fractionator effi-	Fractionator, horizontal, puts liquid to work
What is an engineer worth? Herbert Hubben	*96	ciency	Gage—heta-gage system Dec 9 *120
schools. C. L. Mantell (table) July 8	154	Battery, rechargeable	Gage, oxygen June 24 *68 Gages, pressure . Feb. 18 *222, July 8 *200, Sept. 30 *144 Gage, sight
White House report calls for boost in engineer supply (C)Jan. 21	43	Burner, fue!—sonic Aug. 19 *114 Burner, rapid-heating Dec. 9 *118 Calibrator May 27 *176	Gage, vacuum
Engineers see also Professional Devel- opment Engines		Carbides metal Nov 25 *80	Gas-dispersion systemSept. 2 *60 Gas-permeability unitApr. 29 *181
Internal-combustion engine gives novel role to liquid hydrogen (N). Mar. 18	*94	Carbon cloth Sept. 16 *246 Cart, chemical—mobileJune 24 *70	Gearmotor Apr. 29 *177 Generator Sept. 16 244

Design commons Apr. 54 1945 1946	Gun, metallizing			
Part	Heat evelongers July 8.98 Sent 30	-04	Pump, rotary vaneOct. 28 *190	Valve, glassOct. 28 *104
Part	areat exchangers. buly one, bept.	****	Pumps, rubber-linedJan. 21 *207,	Valve, globe-miniature Feb. 18 *224
Pacific serior called Reserve Ways 1	*68, *144; Nov. 11	*148	Dumm senitors goos May 19 8940	Valve high-pressure
Description of the content of the	Heater inline Jan. 7	*126	Pump, screw	Valve, needle
Secondary Color	Heater, insertion	*78	Pump, sludge	Valves-new type has no moving parts
Secondary Color	Heating elementsApr. 15 *229		Pump, sump-plasticJune 10 *294	
Secondary Color	Sept. 16	*249	Pump, sump—submersibleJune 10 *118	Valve operator
Department of the point No.	Heating system called Electro-wrap	906	Pumps tube Mar 4 *66 Sept 16 *242	Valve positioner Sent 30 *66
Department of the point No.		454	Nov. 11 *148	Valve, relief
Department of the point No.	Hopper, vibratingOct. 14	*265	Purifier, hydrogen	Valve, relief-diaphragm Aug. 19 *114
Indicators Care Apr. 19 19 19 19 19 19 19 1	Hygrometer cell Dec. 23	*122	Purifier, lineAug. 5 159	Valve, rotary
Indicators Care Apr. 19 19 19 19 19 19 19 1	Hygrometer, dew pointNov. 11	*150	Pyrometer, opticalFeb. 4 *152	Valve, safety-reliefJan. 21 *205
Indicators Care Apr. 19 19 19 19 19 19 19 1	Incinerator, industrialOct. 14	*68	Peagtor small June 10 \$116	Valves solenoid Mar 4 *152 June 24
Indicators Care Apr. 19 19 19 19 19 19 19 1	Indicator, continuousApr. 29	*177	Reactor systemOct. 14 116	*154, Aug. 19 *112
March 1940	Indicator-controllerJan. 21	*209	Recorder	
March 1940	Indicator, densityJuly 22	*106	Recorder, multipointSept. 30 *68	Valve, vaporizingAug. 5 *162
March 1940	Indicator, gasOct. 14	*263	Recorder, oxidantJuly 22 *182	Valve, Y-pattern Dec. 9 *240
March 1940	Indicators, level. Apr. 15 *114, Apr.	*116	Recorder temperature Apr 1 *52	Vibration inducers Feb. 18 *110. Apr. 29 *176
Induction of the baths	Indicators liquid-level May 13-240	110	Rectification column Oct. 28 *104	Vibrator
Induction of the baths	June 10	*296	Reducer, speed	Viscometer, process Dec. 23 *56
Information atorage with . July 2 54 September of the content	Indicator, oxygen	238	Reflux controller	Warmers, drum
Information atorage with . July 2 54 September of the content	Indicators, temperature Mar. 4 *66,	*160	Refractometer, sugar	Weighing system helt Jan 7 *140
Second color Seco			27 *173	Wire cloth, Teflon-coated Oct. 14 *259
Second color Seco	Information storage unitJuly 22	104	Regulator, temperatureApr. 15 *222	Workstands, portableFeb. 4 *157
Authorition Sept. 148 Sampler, composite July 1 1 1 1 1 1 1 1 1	Insulation jacketingJan. 21	*207	Regulator, weight	Ethanol-Union Carbide expanding ca-
April Apri	Insulation jacketing, self-fastening-	****	Rotameter, flow	plants (C) Virginia and Texas
April Apri	Insulation strip Sent 2	9148	Sampler Apr 29 *80	Ether-Alkyl vinyl ethers Sept. 2 52
An anomator			Sampler, compositeJan. 21 *205	Ethics
An anomator	ysis	*112	Sampler, Solids Oct. 14 *116	
Manumeter Sept 150 Screen, welge-bat Sept 150 Screen, welge-bat Sept 150 Screen Sept S	Leak checker	¥228	Scanoid	-CE invites readers' views (N)
Meter, deep company 1.00	Manager See Indicators, level	*150		
Meter, deep company 1.00	Manometer, high-vacuum Dec. 22	*122	Scrubber, fume	(text)
Meter Mete			Scrubbers, fume-plastic July 22 185	Engineers speak out-CE reports on
Separator	Metal-fiber materialMar. 18	*114	Scrubber, wet	replies
Separator	Meter, dew-point	*80	Seal, mechanicalJune 10 *302	Fibyl Bromide Dow's great radiation
Separator	Meter heat	9116	Sensor temperature May 27-88, Dec. 9 *235	process wins CE achievement honors
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Meter, heat-transfer June 10	•118	Separator	(chart)
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Meter, moisture Dec. 9	118	Separator material-size Aug 19 0212	Ethylene
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Meter pH-portableJan. 7	•56	Separator, sonicSept. 16 *106	Acetaldehyde via direct oxidation of
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Meter, pipeline	•303	Slide rulesJan. 7 *54, Sept. 16 242	ethylene at Shawinigan (N) Aug. 5 *66
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Meter, piston-oscillatingJune 24	151	Specific-heat apparatusFeb. 4 *100	Acetaidenyde via direct oxidation of
Mill, impact and classifier system. Oct. 2: 406 Milling machine	Mill grinding July 22	*106	Apr. 1 *133	Eugene Guccione
Milling machine June 10 28 106	Mill. impact	*106	Speed control unit for motors, Aug. 5 *80	Badische Anilin ethylene-from-crude
Miller machine 100			Speed reducer, cycloidMar. 18 *243	oil process licensed to Chemico (C)
Miser, portable Mar 4 * * * * * * * * * * * * * * * * * *	Oct. 28	•100	Spray equipmentJune 24 *70	July 8 65
Miser, portable Mar 4 * * * * * * * * * * * * * * * * * *	Milling machineJune 19	-286	Spray gun	vides good yield from yaried feed-
Miser, portable Mar 4 * * * * * * * * * * * * * * * * * *	2 *149 Sept. 30	*68	Spray systemJuly 8 *100	stocks (C)
Miser, portable Mar 4 * * * * * * * * * * * * * * * * * *	Mixer, batch	*176	Strainer, pipeline	Ethylene faces healthy but competi-
Mohluse, electronic—encapsular of the control of th	Mixers Columns carry out multistage			tive ruture—capacity, consumption
Mohluse, electronic—encapsular of the control of th	mixing operationsJan. 21	•77	StrappingFeb. 18 *226	(chart & table) (N)Mar. 18 96
Mohluse, electronic—encapsular of the control of th	Mixer, portable	*114	Switch thermal Sent 16 249	vields high-purity ethylene-flow-
Monitor, color June 10 114 115 1	Mixer, underdrivenJune 10	*116	Tank earOct. 28 *102	
Montor, flow May 13 18 18 18 18 18 18 18	Modules, electronic,—encapsulated		Tank-car-space technology leads to	New processes from Germany and
Montor, flow May 13 18 18 18 18 18 18 18	Oct. 28	104	lighter car	France cater to heavy feedstocks.
Montoring system				N. P. Chopey (charts & table)
Motor, ministure May 3 118 Tester, solida-flow Peb. 18 112 115 1	Monitor, colorJune 10	9174	Mor 19 944	Sent 9 *14
Tester Sept. 15 218 21	Monitor, flow	*174	Mar 18 244	Sept. 2 *34*
Motor Synchronous Provides Brank Company Synchronous Provides Brank Synchronous Provides Propertions Pro	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8	*174 *153 *199	Tester, gas-purity	Ethylene oxide debugs rocket motors (N)
Nozera, infrared. Aug. 19 *205, Nov. 11 1	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13	*174 *153 *199	Mar 18 244 Tester, gas-purity Mar 18 247 Tester, solids-flow Feb. 18 *112 Tester, thickness Nov. 11 *301	Ethylene oxide debugs rocket motors (N)
Packaging machine	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides spark-	*174 *153 *199	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Packaging machine	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides spark- free operation Feb.	*174 *153 *199 *118	Tester, gas-purity	Ethylene oxide debugs rocket motors (N)
Parking machine. July 22 *184	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides spark- free operation Feb.	*174 *153 *199 *118	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Paking, tower—plastic. July 22 *104 Paint imspection device. Oct. 14 *253 Porch, plasma, uses induction heating Porch, plasma, use induction heating Porch, plasma, uses induction heati	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides spark- free operation Feb.	*174 *153 *199 *118	Mar 18 244	Ethylene oxide debugs rocket motors (N) Apr. 15 96 Ethyleneimine debuts as volume Ethyleneimine debuts July 22 96 Ethyleneimine seeks commercial status (C) July 8 66
Paint inspection device. Oct. 14 *269 Paner, graph. Feb 4 *64 Peliet evaluator. Jan. 21 *205 Pipe and fittings, glass-reinforcery. Jan. 21 *205 Pipe and fittings, glass-reinforcery. Jan. 21 *205 Pipe, plastic Nov, 11-303, Nov. 25 *75 Pipe, plastic Nov, 11-303, Nov. 25 *75 Pipe, polyethylene Sept. 16 *236 Pipe, polyethylene Sept. 16 *236 Polarimeter, process. Dec. 23 *54 Polarimeter, process. Dec. 23 *54 Processor, experimental June 10 *286 Processor, experimental June 10 *286 Programmer, card Arv. 29 *84 Processor, experimental June 10 *286 Programmer, card Arv. 29 *84 Pulyerizer and classifier system. Oct. 28 *100 Pulyerizer conquers hard, abrasive Pulyerizer conquers hard, abrasive Pulyerizer conquers hard, abrasive Pulyer, abby Ant. 15 *144 Pulymp, canned Mar. 4 *156 Pulymp, canned Mar. 4 *156 Pulymp, canned Mar. 4 *156 Pulymp, sept. 2-62, Sept. 16 *236 Pump, sept. Peb. 4-165, Feb. 18 *249 Pump, sept. Peb. 4-165, Feb. 18 *249 Pump, sept. Peb. 4-165, Feb. 18 *249 Pump, gear. Feb. 4-165, Feb. 18 *249 Pump, gear. Feb. 4-165, Feb. 18 *252 Pump, injection. Dec. 9 *255 Pump, injection. Dec. 9 *255 Pump, injection. Arc. 15 *164 Pump, minister. Sept. 2-62 Pump, polypopen. Arc. 15 *164 Pump, minister. Sept. 2-62 Pump, polypopen. Arc. 15 *164 Pump, minister. Sept. 2-62 Pump, polypopen. Arc. 15 *164 Pump, injection. Dec. 9 *255 Pump, polypopen. Arc. 15 *164 Pump, injection. Dec. 9 *255 Pump, polypopen. Arc. 15 *164 Pump,	Monitor, flow May 27	*174 *153 *199 *118 62 *110	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Peliet evaluator	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides snark- free operation Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 21 Packaging machine. July 22 Packaging machine. July 22	*174 *153 *199 *118 62 *110 *154	Tester, gas-purity. Mar 18 244 Tester, solids-flow Feb. 18 *112 Tester, thickness. Nov. 11 *301 Tester, ultrasonic Feb. 18 *247 Testing strip. Sept. 16 *241 Thermometers, cryogenic. Mar 37 *90. Thermometers, cryogenic. Mar 150 Thermometers, cryogenic. Mar 150 Thermometers, resistance. Apr. 15 *232 Thermometer, resistance. Nov. 25 *156	Ethylene oxide debugs rocket motors (N)
Pipe plastic Nov, 11-303, Peb. 18 Pe	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides snark- free operation Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 21 Packaging machine. July 22 Packaging machine. July 22	*174 *153 *199 *118 62 *110 *154	Tester, gas-purity. Mar 18 244 Tester, solids-flow Feb. 18 *112 Tester, thickness. Nov. 11 *301 Tester, ultrasonic Feb. 18 *247 Testing strip. Sept. 16 *241 Thermometers, cryogenic. Mar 37 *90. Thermometers, cryogenic. Mar 150 Thermometers, cryogenic. Mar 150 Thermometers, resistance. Apr. 15 *232 Thermometer, resistance. Nov. 25 *156	Ethylene oxide debugs rocket motors (N)
Pipe plastic Nov, 11-303, Peb. 18 Pe	Monitor, flow May 27	*174 *153 *199 *118 62 *110 *154 *188 *104 *269	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pipe, bolyethylene Sept. 16 236 Pipe, stainless steel May 27 172 Plastic perforated ADP 12 Plastic perforated ADP 12 Potentiometer And-held Jup 24 Precipitator, electric Feb. 18 114 Processor, experimental June 10 128 Processor, experimental June 10 128 Programmer, card Aor 29 82 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Pulverizer June 10 128 Pulverizer June 10 128 Pulverizer June 10 128 Pump, carboy Apr. 15 91 Pump, carboy Apr. 15 91 Pump, proportioner Mar. 18 924 Pump, band Pump	Monitor, flow	*174 *153 *199 *118 62 *110 *154 *188 *104 *269	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pipe, bolyethylene Sept. 16 236 Pipe, stainless steel May 27 172 Plastic perforated ADP 12 Plastic perforated ADP 12 Potentiometer And-held Jup 24 Precipitator, electric Feb. 18 114 Processor, experimental June 10 128 Processor, experimental June 10 128 Programmer, card Aor 29 82 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Pulverizer June 10 128 Pulverizer June 10 128 Pulverizer June 10 128 Pump, carboy Apr. 15 91 Pump, carboy Apr. 15 91 Pump, proportioner Mar. 18 924 Pump, band Pump	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides spark- free operation Feb. 18 Ovens, infrared Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy	*174 *153 *199 *118 62 *110 *154 *188 *104 *269 *64 *205	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pipe, bolyethylene Sept. 16 236 Pipe, stainless steel May 27 172 Plastic perforated ADP 12 Plastic perforated ADP 12 Potentiometer And-held Jup 24 Precipitator, electric Feb. 18 114 Processor, experimental June 10 128 Processor, experimental June 10 128 Programmer, card Aor 29 82 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Proversor, experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Provessor experimental June 10 128 Proportioner, liquid July 8 91 Pulverizer June 10 128 Pulverizer June 10 128 Pulverizer June 10 128 Pump, carboy Apr. 15 91 Pump, carboy Apr. 15 91 Pump, proportioner Mar. 18 924 Pump, band Pump	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark Nozzle, sonic Feb. 18 Ovens, infrared Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 S	*174 *153 *199 *118 62 *110 *154 *188 *104 *269 *64 *205 *66	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Transmitters, process Dec. 23 54 16 16 16 17 17 16 17 17	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark Nozzle, sonic Feb. 18 Ovens, infrared Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 S	*174 *153 *199 *118 62 *110 *154 *188 *104 *269 *64 *205 *66	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Transmitters, process Dec. 23 54 16 16 16 17 17 16 17 17	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark Nozzle, sonic Feb. 18 Ovens, infrared Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 S	*174 *153 *199 *118 62 *110 *154 *188 *104 *269 *64 *205 *66	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Potentiometer, hand-heldJune 24 *76	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozele, sonic Peb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 *303, Nov. 25 Packaging machine July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paner, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic-lined Peb. 18 Pipe, plastic-lined Peb. 18 Pipe, ployethylene Sept. 18	*174 *153 *199 *118 62 *110 *154 *104 *269 *64 *205 *66 *78 *236	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Processor, experimental June 10 *286 Proprammer, card Apr. 2 \$25 Proportioner, liquid July 8 *98 Truck, lifft-vacuum Dec. 9 118 Proportioner, liquid July 8 *98 Truck Ifter-vacuum Dec. 9 118 Proportioner, liquid July 8 *98 Truck Ifter-vacuum Dec. 9 118 Pulveriser June 10 114 Truck Malke Apr. 1 *136 Pulveriser and classifier system Oct. 2 * *100 Pulveriser and classifier system Oct. 2 * *100 Pulveriser conquers hard, abrasive solids Sept. 2 Tubing, plastic—flexible Oct. 14 *118 Pump, carboy Apr. 15 *114 Pump, carboy Apr. 15 *214 Apr. 15 *234 May 13 - 118 *237 May 2 * *29 Pump, cryogenic Mar. 18 *214 Pump, carboy Pump, sinliner Pec. 23 *123 Pump, hand Aug. 5 *89 *144 Pump, miniture Pump *18 *194 *49 *40	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozele, sonic Peb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 *303, Nov. 25 Packaging machine July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paner, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic-lined Peb. 18 Pipe, plastic-lined Peb. 18 Pipe, ployethylene Sept. 18	*174 *153 *199 *118 62 *110 *154 *104 *269 *64 *205 *66 *78 *236	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Psychrometer	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic July 22 Packaging machine July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25	*173 *153 *199 *118 *62 *110 *154 *188 *104 *205 *64 *225 *110 *66 *78 *112 *266 *778 *174 *175 *175 *175 *175 *175 *175 *175 *175	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Psychrometer	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic July 22 Packaging machine July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25	*173 *153 *199 *118 *62 *110 *154 *188 *104 *205 *64 *225 *110 *66 *78 *112 *266 *778 *174 *175 *175 *175 *175 *175 *175 *175 *175	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Psychrometer	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Ovens, infrared Aug. 19 *205, Nov. 11 **203.** Nov. 25 **Packaging machine July 22 **Packing, tower—plastic July 22 **Packing, tower—plastic July 22 **Paint inspection device Oct. 14 **Paner, graph Feb 4 **Pellet evaluator June 24 **Pipe, plastic Nov, 11-303, Nov. 25 **Pipe, plastic Nov, 11-503, Nov. 25 **P	*173 *153 *199 *118 *62 *110 *154 *188 *104 *188 *104 *188 *104 *188 *104 *174 *174 *174 *174 *174 *174 *174 *17	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pulveriser June 10 286 Tube, heat-exchanger Sept. 2 90 Pulveriser and classifier system. Oct. 28 *100 Pulveriser and classifier system. Oct. 29 *100 Pulveriser and classifier system. Oct. 19 *100 Pulveriser and classifier system. Oct	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packaging machine. July 22 Packing, tower-plastic. July 22 Packing, tower-plastic. July 22 Packing, tower-plastic. July 22 Packing tower-plastic. Oct. 4 Pack 12 Packing tower-plastic. Sept. 30 Pipe, plastic. Nov, 11-203, Nov. 25 Pipe, plastic. Nov, 11-203, No	*174 *159 *118 *153 *199 *118 *62 *1110 *154 *188 *104 *265 *64 *205 *66 *112 *236 *112 *237 *114 *286 *82 *114 *286 *82 *82 *82 *82 *82 *82 *82 *82 *82 *82	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pulverizer and classifier system. Oct. 28 *100 Tubling, plastic—flexible Oct. 14 *118 Solids Nept. 36 *168 Nept. 36 *156 Tubling, pre-insulated Nov. 11 *168 Tubling, pre-insulated Nov. 11	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct 14 Paper, graph Feb 4 Pellet evaluator Juny 22 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-303	*174 *153 *199 *153 *199 *118 *153 *199 *118 *118 *118 *118 *118 *119 *119	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Solids	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozale, sonic Feb. 4 Nozale, sonic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator July 22 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-803, Nov. 25 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Lot. 3 Potentiometer, hand-held June 28 Processor, experimental June 10 Programmer, card Apr. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulyeriser June 10	*174 *153 *199 *1153 *199 *1153 *199 *1153 *1153 *1153 *1153 *1154	Mar 18 247	Ethylene oxide debugs rocket motors (N) Apr. 15 Ethylenelmine Ethylenelmine debuts as volume chemical
Pump. carboy Apr. 15 114 147	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides smark- free operation Feb. 4 Nozele, sonic Peb. 18 Ovens, infrared. Aug. 19 *205, Nov. 25 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paner, graph. Feb. 4 Peljet evaluator. Jan. 21 Pipe and fittings, glass-reinforced epoxy Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 26 Pipe, plastic. Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, N	*174 *153 *199 *153 *199 *118 *153 *199 *118 *154 *154 *154 *154 *164 *164 *164 *164 *164 *164 *164 *16	Mar 18 247	Ethylene oxide debugs rocket motors (N)
Pump. canned	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides smark- free operation Feb. 4 Nozele, sonic Peb. 18 Ovens, infrared. Aug. 19 *205, Nov. 25 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paner, graph. Feb. 4 Peljet evaluator. Jan. 21 Pipe and fittings, glass-reinforced epoxy Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 26 Pipe, plastic. Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, N	*174 *153 *199 *153 *199 *118 *153 *199 *118 *154 *154 *154 *154 *164 *164 *164 *164 *164 *164 *164 *16	Mar 18 244	Ethylene oxide debugs rocket motors (N) Apr. 15 Ethylenelmine Ethylenelmine debuts as volume chemical
Pumps diaphragm Feb. 4 * *54. Apr. Valve ball—cryogenic Cet. 28 * * * * * * * * * * * * * * * * * *	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint impection device. Oct. 14 Paper, graph Feb. 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic ined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30	*174 *153 *199 *153 *199 *153 *199 *153 *199 *154 *154 *154 *154 *154 *154 *154 *154	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pumps diaphragm Feb. 4 * *54. Apr. Valve ball—cryogenic Cet. 28 * * * * * * * * * * * * * * * * * *	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint impection device. Oct. 14 Paper, graph Feb. 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic ined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30	*174 *153 *199 *153 *199 *153 *199 *153 *199 *154 *154 *154 *154 *154 *154 *154 *154	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pumps diaphragm Feb. 4 * *54. Apr. Valve ball—cryogenic Cet. 28 * * * * * * * * * * * * * * * * * *	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint impection device. Oct. 14 Paper, graph Feb. 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic ined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30	*174 *153 *199 *153 *199 *153 *199 *153 *199 *154 *154 *154 *154 *154 *154 *154 *154	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pumps diaphragm Feb. 4 * *54. Apr. Valve ball—cryogenic Cet. 28 * * * * * * * * * * * * * * * * * *	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint impection device. Oct. 14 Paper, graph Feb. 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic ined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30	*174 *153 *199 *153 *199 *153 *199 *153 *199 *154 *154 *154 *154 *154 *154 *154 *154	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pumps diaphragm Feb. 4 * *54. Apr. Valve ball—cryogenic Cet. 28 * * * * * * * * * * * * * * * * * *	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, sinilature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozie, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint impection device. Oct. 14 Paper, graph Feb. 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic. Nov 11-303, Nov. 25 Pipe, plastic ined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30	*174 *153 *199 *153 *199 *153 *199 *153 *199 *154 *154 *154 *154 *154 *154 *154 *154	Mar 18 247	Ethylene oxide debugs rocket motors (N)
Pumps diaphragm Feb. 4 * *64, Apr.	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozele, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paper, graph Feb 4 Paint inspection device. Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic lined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Polarimeter, process Dec. 23 Potentiometer, hand-held. June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulveriser and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids. Sept. 30 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, canned Jan. 21-209, Apr. 40 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-309, Apr. 15 Pump, carboy July 22 184, Aug. 27 *90, July 22 184, Aug. 27 *80, July 22 184, Aug. 28 Pump. 28	*174 *153 *199 *153 *191 *153 *191 *153 *191 *154 *154 *154 *154 *154 *154 *154 *15	Mar 18 247	Ethylene oxide debugs rocket motors (N)
Pump, hand. Aug. 5 *86 Valve, bleeder Aug. 18 *218 Dow gives bigger blast (C) Apr. 15 84 Pump/homogenizer Aug. 5 *86 Valve, blow—digester Peb. 18 *112 Pumps, injection Apr. 1 *50, Sept. 30 *142 Valve, bounctiess Mar. 18 240 Valve, butterfly. Sept. 30 *66, Oct. 14 *257 Valves, b	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozele, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paper, graph Feb 4 Paint inspection device. Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic lined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Polarimeter, process Dec. 23 Potentiometer, hand-held. June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulveriser and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids. Sept. 30 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, canned Jan. 21-209, Apr. 40 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-309, Apr. 15 Pump, carboy July 22 184, Aug. 27 *90, July 22 184, Aug. 27 *80, July 22 184, Aug. 28 Pump. 28	*174 *153 *199 *153 *191 *153 *191 *153 *191 *154 *154 *154 *154 *154 *154 *154 *15	Tester, gas-purity	Ethylene oxide debugs rocket motors (N)
Pump, hand. Aug. 5 *86 Valve, bleeder Aug. 18 *218 Dow gives bigger blast (C) Apr. 15 84 Pump/homogenizer Aug. 5 *86 Valve, blow—digester Peb. 18 *112 Pumps, injection Apr. 1 *50, Sept. 30 *142 Valve, bounctiess Mar. 18 240 Valve, butterfly. Sept. 30 *66, Oct. 14 *257 Valves, b	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozele, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paper, graph Feb 4 Paint inspection device. Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic lined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Polarimeter, process Dec. 23 Potentiometer, hand-held. June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulveriser and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids. Sept. 30 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, canned Jan. 21-209, Apr. 40 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-309, Apr. 15 Pump, carboy July 22 184, Aug. 27 *90, July 22 184, Aug. 27 *80, July 22 184, Aug. 28 Pump. 28	*174 *153 *199 *153 *191 *153 *191 *153 *191 *154 *154 *154 *154 *154 *154 *154 *15	Mar 18 244 Tester, gas-purity	Ethylene oxide debugs rocket motors (N) Apr. 15 Ethylenelmine Ethylenelmine debuts as volume chemical
Pump, hand. Aug. 5	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozele, sonic Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic. July 22 Packing, tower—plastic. July 22 Paint inspection device. Oct. 14 Paper, graph Feb 4 Paint inspection device. Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, plastic lined Feb. 18 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Polarimeter, process Dec. 23 Potentiometer, hand-held. June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulveriser and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids. Sept. 30 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, canned Jan. 21-209, Apr. 40 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, canned Jan. 21-209, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-308, Apr. 15 Pump, carboy Jan. 21-309, Apr. 15 Pump, carboy July 22 184, Aug. 27 *90, July 22 184, Aug. 27 *80, July 22 184, Aug. 28 Pump. 28	*174 *153 *199 *153 *191 *153 *191 *153 *191 *154 *154 *154 *154 *154 *154 *154 *15	Tester, gas-purity. Mar 18 244 Tester, solids-flow Feb. 18 217 Tester, thickness. Nov. 11 130 Tester, ultrasonic Feb. 18 247 Tester, thickness. Nov. 11 130 Tester, ultrasonic Feb. 18 247 Thermometers, cryogenic May 27 90. Thermometers, cryogenic May 27 90. Thermometers, cryogenic May 27 90. Thermometers, resistance. Nov. 25 155 Torch, electric. Aug. 19 206 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 118 Transmitter Transmitter, feb. 4 62, Apr. 29 84 Transmitters, pressure. June 10 288. July 8 201, Oct. 14 2267, Nov. 26 126 Transmitters, pressure. June 10 288. July 8 201, Oct. 14 2267, Nov. 26 126 Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 290. Transmitters, pressure. June 10 200. Transmitt	Ethylene oxide debugs rocket motors (N)
Pumps Inline	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides smark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic Peb. 4 Nozzle, sonic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Nov. 12 Polyethylene Sept. 16 Polyethylene Sept. 16 Polyethylene Nov. 12 Polyethylene Nov. 12 Polyethylene Nov. 12 Polyethylene Nov. 12 Polyethylene Nov. 14 Propersioner, 19 Polyethylene June 10 Programmer, card Aor. 29 Proportioner, liquid July & Psychrometer June 10 Pulyerizer and classifier system. Oct. 28 Pulyerizer conquers hard, abrasive solids Sept. 30 Pump, carboy Aor. 15 Pump, carboy Aor. 15 Pump, carboy Aor. 15 Pump, carboy Nov. 11 Pumps, gear. Feb. 4-156, Feb. 18 Pumps, diaphragm Feb. 4-54, Aug. 19 Pumps, gear. Feb. 4-156, Feb. 18 Pumps, diaphragm Feb. 4-54, Aug. 19 Pumps, gear. Feb. 4-156, Feb. 18 Pumps, gear. Feb. 4-156, Feb. 18 Pumps, diaphragm Feb. 4-64, Apr. 1-64 Polec. 23	*174 *153 *199 *153 *199 *153 *199 *154 *158 *100 *154 *188 *104 *188 *104 *154 *155 *112 *236 *66 *78 *295 *112 *236 *82 *198 *114 *156 *100 *64 *1156 *115	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 *12 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *24 Thermometers, cryogenic. May 27 *90. Thermometers, resistance. Nov. 25 *155 Torch, electric. Aug. 19 *206 Torch, plasma, uses induction heating. Transmitter Feb. 4 *158 Transmitter, level. Feb. 4 *158 Transmitter, flow. Feb. 4-62, Apr. 29 *84 Transmitter, level. Feb. 18 *14 Transmitters, pneumatic. Feb. 4 *158 Transmitters, pressure. June 10 *288. July 8 201, Oct. 14 *267, Nov. 26 *155 Transmitters, pressure. June 10 *288. Transmitter, pres	Ethylene oxide debugs rocket motors (N)
Pumps metering Jan. 7 *54, Feb. Valve, controls Mat. 4 68 18 *218, Apr. 29 *2174, Sept. 16 *247. Valve, control Nov. 11 *150	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, synchronous, provides swark- free operation Feb. 18 Ovens, infrared. Aug. 19 *265, Nov. 11 Packaging machine. July 22 Packing, tower—plastic July 22 Paint inspection device. Oct. 14 Paper, graph Feb 4 Peliet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic. Nov, 11-303, Nov. 25 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated. Apr. 15 Polarimeter, process Dec. 23 Potentiometer, hand-held. June 24 Precipitator, electric. Feb. 18 Processor, experimental June 10 Programmer, card Aor. 29 Proportioner, liquid. July 8 Psychrometer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids. Sept. 30 Pump, carboy Apr. 15 Pumps, centrifugal Jan. 21-299, Feb. 4 868, Mar. 18 *246, Apr. 1-64, Apr. 15 Pump, carboy Nay 2* Pump, cryogenie Sept. 2-62, Sept. 18 Pumps, centrifugal Jan. 21-299, Feb. 4 87 Pumps, centrifugal Sept. 2-62, Sept. 18 Pumps, centrifugal Sept. 2-62, Sept. 18 Pumps, gear. Feb. 4-156, Feb. 18 *223 Pump, hand. Dec. 23	*174 *153 *199 *153 *199 *153 *199 *118 *153 *199 *118 *154 *154 *154 *154 *154 *154 *154 *154	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 *112 Tester, thickness. Nov. 11 *301 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *212 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *224 Thermometers, cryogenic. May Nov. 21 Thermometers, cryogenic. May Nov. 11 *50 Thermometers, celectronic. Mar. 18 *224 Thermometer, resistance. Nov. 25 *155 Torch, electric. Aug. 19 *206 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 *118 Transmitter Feb. 4 *158 Transmitters, flow. Feb. 4 *62. Apr. 29 *84 Transmitters, pressure. June 10 *288,	Ethylene oxide debugs rocket motors (N)
Pumps metering Jan. 7 *54, Feb. Valve, controls Mat. 4 68 18 *218, Apr. 29 *2174, Sept. 16 *247. Valve, control Nov. 11 *150	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides smark- free operation Feb. 4 Nozale, sonic Feb. 4 Nozale, sonic Peb. 4 Nozale, sonic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic perforated Apr. 15 Polarimeter, process led Apr. 15 Polarimeter, process led Apr. 15 Polarimeter, process led Apr. 15 Processor, experimental June 10 Programmer, card Apr. 29 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, carboy Apr. 15 Pump, carboy Paper 11-34 Pumps, diaphragm Peb. 15 Pump, cryogenie Mar. 4 Pumps, diaphragm Peb. 15 Pump, diaphragm Peb. 15 Pump, diaphragm Peb. 15 Pump, May 27 Pumph, hand Aug. 5 Pump, hand Aug. 5 Pump, hand Aug. 5	*174 *153 *199 *154 *153 *199 *154 *153 *199 *154 *154 *158 *104 *154 *154 *154 *154 *154 *154 *154 *15	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 *112 Tester, thickness. Nov. 11 *301 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *212 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *224 Thermometers, cryogenic. May Nov. 21 Thermometers, cryogenic. May Nov. 11 *50 Thermometers, celectronic. Mar. 18 *224 Thermometer, resistance. Nov. 25 *155 Torch, electric. Aug. 19 *206 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 *118 Transmitter Feb. 4 *158 Transmitters, flow. Feb. 4 *62. Apr. 29 *84 Transmitters, pressure. June 10 *288,	Ethylene oxide debugs rocket motors (N) Apr. 15 Ethylenelmine Ethylenelmine debuts as volume chemical
Pump, miniature	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Ovens, infrared. Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-503, Nov. 25 Pipe, plastic Nov, 11-504, Nov. 25 Pipe, plastic Nov, 11-505, Nov. 25 Pipe	*174 *153 *199 *118 *153 *199 *118 *118 *118 *119 *119 *119 *119	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 *112 Tester, thickness. Nov. 11 *301 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *212 Tester, thickness. Nov. 11 *301 Tester, ultrasonic. Feb. 18 *224 Thermometers, cryogenic. May Nov. 21 Thermometers, cryogenic. May Nov. 11 *50 Thermometers, celectronic. Mar. 18 *224 Thermometer, resistance. Nov. 25 *155 Torch, electric. Aug. 19 *206 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 *118 Transmitter Feb. 4 *158 Transmitters, flow. Feb. 4 *62. Apr. 29 *84 Transmitters, pressure. June 10 *288,	Ethylene oxide debugs rocket motors (N)
Pump, miniature	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Ovens, infrared. Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-503, Nov. 25 Pipe, plastic Nov, 11-504, Nov. 25 Pipe, plastic Nov, 11-505, Nov. 25 Pipe	*174 *153 *199 *118 *153 *199 *118 *118 *118 *119 *119 *119 *119	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pump miniature Sept. 2 *151 Valves—control-valve body Feb. 18 *114 mixed solvent-extraction process Pump—multihead micropump Aug. 19 *112 Valve, diaphragm June 24 79 Valve, diaphragm June 24 70 Valve, diaphragm June 24 70 Valve, diani May 27 \$2 Valve, diani May 13 *241 Valve, diani May 14 Valve, diani May 15 *241 Valve, diani M	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozale, sonic Feb. 4 Nozale, sonic Peb. 4 Nozale, sonic Peb. 18 Ovens, infrared. Aug. 19 *29 Nov. 25 Packaging machine July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, processed Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric Feb. 18 Processor, experimental June 19 Programmer, card Apr. 15 Programmer, card Apr. 15 Pomp Sept. 30 Pulyerizer June 10 Pulverizer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30 Pump, carboy Apr. 15 Pump, diaphragm. Feb. 4 Pot. Sept. 16 Pump, cryogenic May 27 Pumps, diaphragm. Peb. 4 Pot. 32 Pump, hand. Dec. 23 Pump, hand. Dec. 27 Pumps, metering Jan. 7 Pumps, 1816-16-24 Pumps, metering Jan. 7 Pumps, 1816-16-26 Pump metering Jan. 7 Pump Pumps, May 27 Pumps, metering Jan. 7 Pump Pumps, May 27 Pumps, metering Jan. 7 Pump Pumps, May 27 Pumps, peterifican Apr. 17 Pumps, 1816-18-21 Pump Pumps, May 27 Pumps, 1816-18-21 Pump Pumps, May 27 Pumps, 1816-18-21 Pump Pumps, May 27 Pumps, 1816-18-21 Pump Pumps, 1816-18-21 Pump Pumps, 1816-18-21 Pump Pumps, 1816-18-21 Pump Pumps, 18	*174 *153 *199 *153 *191 *153 *191 *153 *191 *153 *191 *154 *154 *154 *154 *154 *154 *154 *15	Mar 18 244	Ethylene oxide debugs rocket motors (N)
Pump, polypropylene Aug. 19 *114 Valve, drain May 27 *25 J. E. Colman Mar. 4 *93 Pump, proportioning Jan. 7 *143 Valve, dry-materials May 13 *241 Fission-product recovery—G-E's short-valve, extruder Sept. 2 154 cut process melds solvents (chart)	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Ovens, infrared Aug. 19 *205, Nov. 11 Packaging machine July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Packing, tower—plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb. 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-503, Nov. 25 Pipe, pla	*174 *153 *199 *118 *129 *118 *129 *118 *129 *118 *129 *118 *129 *154 *188 *104 *188 *104 *129 *165 *129 *165 *129 *174 *123 *123 *114 *123 *124 *125 *123 *124 *125 *123 *124 *125 *123 *124 *125 *123 *123 *123 *123 *123 *123 *123 *123	Tester, gas-purity	Ethylene oxide debugs rocket motors (N)
Pump, polypropylene Aug. 19 *114 Valve, drain May 27 *25 J. E. Colman Mar. 4 *93 Pump, proportioning Jan. 7 *143 Valve, dry-materials May 13 *241 Fission-product recovery—G-E's short-valve, extruder Sept. 2 154 cut process melds solvents (chart)	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, similature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozale, sonic Feb. 4 Nozale, sonic Peb. 4 Nozale, sonic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic May 27 Pipe, polyethylene Sept. 16 Pipe, stainless steel May 27 Plastic, perforated Apr. 15 Polarimeter, processed Dec. 23 Potentiometer, hand-held June 24 Precipitator, electric Feb. 18 Processor, experimental June 19 Programmer, card Apr. 15 Programmer, card Apr. 15 Poump anned Sept. 30 Pulyerizer June 10 Pulverizer June 10 Pulverizer and classifier system. Oct. 28 Pulverizer conquers hard, abrasive solids Sept. 30 Pump, carboy Apr. 15 Pump, diaphragm. Feb. 4 Pot. 327 Pumps, diaphragm. Feb. 4 Pot. 327 Pumps, diaphragm. Feb. 4 Pot. 327 Pumps, diaphragm. Apr. 1 Pot. 327 Pumps, metering Jan. 7 Pumps, Heletion Dec. 23 Pump, minieture. Sept. 2 Pump, miniature. Sept. 3 Pump, miniature. Sept. 3 Pump. Sept. 4 Pump. Sept. 3 Pump. Sept. 4 Pump. Sept. 3 Pump. Sept. 4 Pump. Sept. 4 Pum	*174 *155 *118 *153 *193 *118 *153 *193 *118 *154 *154 *154 *154 *154 *154 *154 *154	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 217 Tester, thickness. Nov. 11 132 Tester, thickness. Nov. 11 132 Tester, ultrasonic. Feb. 18 247 Tester, ultrasonic. Feb. 18 218 Testing strip. Sept. 16 241 Thermometers, cryogenic. May 27 290. Thermometers, cryogenic. May 27 290. Thermometers, resistance. Nov. 25 155 Torch, electric. Aug. 19 220. Thermometer, resistance. Aug. 19 200 Torch, plasma, uses induction heating Transducer, turbine flow. Oct. 14 118 Transmitter Transmitter Feb. 4 200 Transmitters, pressure. June 10 288. July 8 201, Oct. 14 2267, Nov. 26 156 Transmitters, pressure. June 10 288. July 8 201, Oct. 14 2267, Nov. 26 156 Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 288. Transmitters, pressure. June 10 290 Trap, steam Apr. 15 221 Truck, Hiter June 10 290 Trap, steam Apr. 15 216 Truck, Wilker Sept. 2 318 Truck, Hiter May. 12 118 Truck, Wilker Sept. 2 318 Truck, Wilker Aug. 19 200 Turbing, plastic—flexible Oct. 14 118 Tubing, pre-insulated Nov. 11 148 Turbidity instrument Nov. 11 292 Union, gear-powered, for plping Valve, automatic shutoff. Dec. 9 227 Turbe, ball. Feb 18 2114, Apr. 1 504. Valve, automatic shutoff. Dec. 9 227 Valve, ball—cryogenic Oct. 28 188 Valve, ball—titanium Dec. 22 188 Valve, ball—titanium Dec. 23 184 Valve, bollow—digeorer Feb. 18 2114 Valve, compressor Mar. 4 267 Valve, compressor Mar. 4 267 Valve, compressor Mar. 4 267 Valve, control—manual May 13 239 Valve, valve, control—control-valve body Feb. 18 114	Ethylene oxide debugs rocket motors (N)
Pumps, rotaryApr. 15 *226., *229; Valve, extruderSept. 2 154 cut process melds solvents (chart)	Monitor, flow	*174 *155 *118 *153 *118 *153 *118 *153 *118 *154 *118 *154 *154 *154 *154 *154 *154 *154 *112 *236 *64 *78 *236 *112 *236 *114 *236 *1114 *236 *1114 *156 *114 *156 *114 *114 *156 *114 *156 *114 *114 *156 *114 *114 *114 *114 *114 *114 *114 *11	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 247 Tester, thickness. Nov. 11 120 Tester, ultrasonic Feb. 18 218 Testing strip. Sept. 16 221 Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, resistance. Nov. 21 150 Thermometer, resistance. Nov. 25 155 Torch, electric. Aug. 19 200 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 218 Transmitter Feb. 4 20 Transmitters, flow. Feb. 4 62, Apr. 29 284 Transmitters, flow. Feb. 4 62, Apr. 29 284 Transmitters, pressure. June 10 290 Trap, magnetic June 10 290 Trap, magnetic June 10 290 Trap, steam Apr. 15 226 Truck, lift-vacuum Dec. 9 118 Truck trailer May 13 211 Truck trailer Sept. 2 20 Tubing, plastic-flexible Oct. 4 218 Tubing, plastic-flexible Oct. 4 218 Tubing, plastic-flexible Oct. 4 218 Turbidity instrument Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 2205 Valve, bellows Aug. 19 2205 Valve, blow-digester Feb. 18 211 Valve, diaphram June 24 70 Valve 24 24 24 24 24 24 24 24 24 24 24 24 24	Ethylene oxide debugs rocket motors (N)
Pumps, rotaryApr. 15 *226., *229; Valve, extruderSept. 2 154 cut process melds solvents (chart)	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic Peb. 4 Nozzle, sonic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-304, Nov. 25 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-304, Nov. 25 Pipe, plastic	*174 *153 *199 *114 *123 *244 *114 *123 *244 *114 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *241 *241 *241 *241 *241 *241	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 247 Tester, thickness. Nov. 11 120 Tester, ultrasonic Feb. 18 218 Testing strip. Sept. 16 221 Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, resistance. Nov. 21 150 Thermometer, resistance. Nov. 25 155 Torch, electric. Aug. 19 200 Torch, plasma, uses induction heating Transducer, turbine flow Oct. 14 218 Transmitter Feb. 4 20 Transmitters, flow. Feb. 4 62, Apr. 29 284 Transmitters, flow. Feb. 4 62, Apr. 29 284 Transmitters, pressure. June 10 290 Trap, magnetic June 10 290 Trap, magnetic June 10 290 Trap, steam Apr. 15 226 Truck, lift-vacuum Dec. 9 118 Truck trailer May 13 211 Truck trailer Sept. 2 20 Tubing, plastic-flexible Oct. 4 218 Tubing, plastic-flexible Oct. 4 218 Tubing, plastic-flexible Oct. 4 218 Turbidity instrument Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Union, gear-powered, for piping Valve, automatic Nov. 11 292 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 205 Valve, bellows Aug. 19 2205 Valve, bellows Aug. 19 2205 Valve, blow-digester Feb. 18 211 Valve, diaphram June 24 70 Valve 24 24 24 24 24 24 24 24 24 24 24 24 24	Ethylene oxide debugs rocket motors (N)
Mily 10 -110 volve, health	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides swark- free operation Feb. 4 Nozzle, sonic Feb. 4 Nozzle, sonic Peb. 4 Nozzle, sonic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-304, Nov. 25 Pipe, plastic Nov, 11-303, Nov. 25 Pipe, plastic Nov, 11-304, Nov. 25 Pipe, plastic	*174 *153 *199 *114 *123 *244 *114 *123 *244 *114 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *123 *244 *241 *241 *241 *241 *241 *241 *241	Tester, gas-purity. Mar 18 244 Tester, colids-flow Feb. 18 247 Tester, thickness. Nov. 11 120 Tester, ultrasonic Feb. 18 218 Testing strip. Sept. 16 221 Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, cryogenic May 27 290, Thermometers, resistance. Nov. 21, 150 Thermometers, resistance. Nov. 25 155 Torch, electric. Aug. 19 200 Torch, plasma, uses induction heating Transmitter Grow Feb. 4 200 Transmitter, level. Feb. 4 216 Transmitters, flow. Feb. 4 62, Apr. 29 284 Transmitter, level. Feb. 18 114 Transmitter, level. Feb. 18 114 Transmitters, pressure. June 10 290 Trap, magnetic June 10 290 Trap, steam Apr. 15 226 Truck, lift-vacuum Dec. 9 118 Truck trailer May 13 116 Truck trailer Sept. 2 10 Truck, lift-vacuum Dec. 9 118 Truck, malke Nov. 11 148 Trubiding, pre-insulated Nov. 11 148 Tubing, plastic-flexible Oct. 4 218 Turbidity instrument Nov. 11 292 Union, gear-powered, for piping Valve, automatic Shutoff. Dec. 9 220 Valve, ball—cryogenic Oct. 28 188 Valve, ball—cryogenic Oct. 28 188 Valve, ball—cryogenic Oct. 14 226 Valve, blow—digester Feb. 18 114 Valve, diaphram June 24 Valve, blow—digester Feb. 18 115 Valve, control—manual May 13 213 Valve, diaphram June 24 Valve, drain May 27 24 Valve, drain May 27 Va	Ethylene oxide debugs rocket motors (N)
	Monitor, flow May 27 Monitoring system Feb. 4 Motor, air July 8 Motor, miniature May 13 Motor, synchronous, provides mark- free operation Feb. 4 Nozale, sonic Feb. 4 Nozale, sonic Sep. 4 Packaging machine July 22 Packing, tower-plastic July 22 Packing, tower-plastic July 22 Paint inspection device Oct. 14 Paper, graph Feb 4 Pellet evaluator Jan. 21 Pipe and fittings, glass-reinforced epoxy Sept. 30 Pipe, plastic Sep. 4 Pipe, plastic Sep. 4 Pipe, plastic Sep. 4 Pipe, polyethylene Sept. 16 Pipe, polyethylene Sept. 16 Pipe, polyethylene Sep. 16 Pipe, polyethylene Sep. 16 Pipe, polyethylene Sep. 16 Pipe, polyethylene Sep. 16 Polarimeter, process Dec. 22 Potentiometer, hard-held June 24 Preceipitator, electric Feb. 18 Processor, experimental June 10 Proportioner, liquid July 8 Psychrometer June 10 Proportioner, liquid July 8 Psychrometer June 10 Pulverizer and classifier system Oct. 28 Pump, carboy Apr. 15 Pump, cryogenic Mar. 4 Pumps, centrifugal Jan. 21-299, Feb. 18 Pump, cryogenic Mar. 4 Pumps, centrifugal Jan. 21-299, Feb. 18 Pump, cryogenic Mar. 18 Pump, polyethylene Sept. 16 Pump, proportioning Sep. 17 Pumps, 10line Apr. 1 *55, Aug. 19 Pump, pipicton Dec. 23 Pump miniature Oct. 14-116, Dec. 23 Pump miniature Oct. 14-116, Dec. 22 Pump piston Jan. 27 Pumps, protary Apr. 15 *224, *229;	*174 *153 *199 *114 *153 *199 *114 *153 *199 *115 *115 *115 *115 *115 *115 *115	Tester, gas-purity. Mar 18 244 Tester, blickness. Nov 11 *301 Tester, thickness. Nov 11 *301 Tester, ultrasonic. Feb. 18 *112 Tester, thickness. Nov 11 *301 Tester, ultrasonic. Feb. 18 *241 Thermometers, cryogenic. May 7 * 9. Thermometers, cryogenic. May 8 * 10. Thermometers, cryogenic. May 15 * 241 Thermometers, resistance. Nov 25 * 155 Torch, electric. Aug. 19 * 206 Torch, plasma, uses induction heating Aug. 19 * 110 Transducer, turbine flow Oct. 14 * 118 Transmitter Transmitter, frow. Feb. 4 * 62 Transmitters, flow. Feb. 4 * 62 Transmitters, pressure. June 19 * 78 Transmitters, pressure. June 19 * 78 Transmitters, pressure. June 19 * 100 Transmitters, ordineter July 8 * 100 Trap, magnetic June 10 * 296 Trap, magnetic June 10 * 296 Truck infit—vacuum Dec. 9 * 118 Truck trailer May 13 * 116 Truck, walkle Apr. 1 * 326 Truck, walkle Apr. 1 * 326 Truck, walkle Apr. 1 * 136 Tube, heat-exchanger Sept. 2 * 60 Tubing, glass-ther Aug. 5 * 159 Tubing, plastic—flexible Oct. 14 * 118 Turbidimeter Dec. 9 * 120 Turbidity instrument Nov. 11 * 124 Turbidity instrument Dec. 9 * 120 Turbidity	Ethylene oxide debugs rocket motors (N)

Israeli process, called Selectall for sol- vent extraction of metals to get pilot		Relate filtration to heat transfer, G, Q, MartinJan. 21 *10:	rigid foam use (C)
plant (C)	88	Coping with the fire menace. H. E.	EDOXY beads simplify foaming proce-
Potash & Chemical's borate extrac- tion process wins CE achievement award. C. R. Havighorst (chart)		Webb, Jr	
award. C. R. Havighorst (chart) Nov. 11	*228	safety push. Herbert Popper.Jan. 7 *9: Fertilizer fights forest fires (N)	
Liquid-liquid extraction—report. Oberg & Jones (charts & tables)July 22	*119	Fire extinguisher uses fluorocarbon	(N) July 22 *78 Foamed plastisol Apr. 1 *46 General Tire seeks patent recognition on plowing agents (C) Luly 22 69
Platinum metals recovery requires		fluid	New method of foaming plastic for
long, complex operations—flowsheet. Gouldsmith & WilsonNov. 25 Single-stage pressure extractor, R. A.		Flame retarderOct. 28 96	Nonporous, flexible urethane foam
Solvent extraction process for desalt-	•158	Phosphorus favored for use in self-	July 22 *98
ing water described at AIChE meeting (C)	81	extinguishing plastics (C)Apr. 29 Urethane foam—fire retardants promise sales leap for rigid foams. Frances Arne (N)Sept. 16 *86	Polystyrene core for solid rocket (N)
covers aromatics (chart) (N)		Flocculants	Prefabricated foams: new outlet for
Extrusion Sept. 16	•78	Coagulant aids called Primafioc Feb. 18 106	
Extruding a plastic sheath over steel pipe (N)Dec. 23	*34	Coagulant aid called Sink-Floc Sept. 16 98	leap based on new foaming methods, fire-retardants—views of CE panel.
Phenolic molding resins made by new extrusion process at Reichhold (C)		Synthetic coagulant called Cat-Floc Apr. 15 106	Frances Arne (N)
Plastics' premium properties pre-	33	Synthetic flocculants set for plunge into water—market outlook (table)	from Du Pont (C)May 27 62
served by screwless extruder (C) Jan. 7	23	Flowmeters—How to select the best flow-	all-plastic boatJune 10 *108
Polyethylene jacketingSept. 16	96	meter. L. R. DriskellMar. 4 *83	tic-Union Carbide patents process
F		Acetaldehyde via ethylene oxidation gets tryout in single-stage design.	(C)
Feeders		Eugene Guccione Dec. 9 *150 Anhydrous ammonia via Casale proc-	ments from petroleum (C)Jan. 7 21
Gravity feeder solves gummy problem. T. J. Tully (P.N.)May 13 A venturi feeder for fluid-bed systems.	*196	ess. Carra & McAllisterDec. 23 *62 Azo dyes—Basics of azo dye synthe-	essing roles (C)Aug. 5 48
Lee Jones (P.N.)Sept. 2 Fermentation—Wine additive slows fer-	•112	sis. Eugene GuccioneAug. 19 *138 Boron nitride—Conventional synthesis	Additive kills microorganisms in diesel fuels
mentation, substitutes for pasteuri-		makes unusual refractory material. J. W. GilpinOct. 28 *110 Carbonization of lignite reaches com-	Addition management and to the Heart of
Yertilizers Ammonia producers ride high on ferti-	62	mercial stage at Husky Briquetting.	Additive—magnesium oxide in fluquits form
lizer boom (charts & table) (N) Sept. 30	*40	S. Y. MargolinJuly 8 108 Cottonseed—making the most out of cottonseed processing. P. J. Brennan	flowsheet. S. V. MargolinJuly 8 108
Fertilizer fights forest fires (N) June 10	102	Jan. 7 *66 Cryogenic washing scrubs hydrogen	Steel (N)
India strives to right fertilizer imbal- ance (N)Oct. 28	88	for rockets. Eugene Guccione. May 13 *150	spheres (N)
Plants—Estimating costs of U.S. plants abroad—CE Cost File (tables)	0.9	Cumene—World's largest cumene plant features H ₃ PO ₄ alkylation. Eugene Guccione	"Gas recycle hydrogenation" process from England makes fuel gas from
July 8 Plants—semiannual inventory of new	168	Dacron-Simple chemicals take tortu-	light petroleum distillate (C) Feb. 18 79
plants and facilities. Apr. 15-163, Oct. 28	127	ous route to Dacron at Du Pont. Eugene Guccione Mar. 4 *76 Ethylene—Revamped naphtha crack-	Hybrid reactor fuels proposed at Nu-
Rotary kiln may make metaphosphate	•62	ing for high-purity ethylene. Eugene Guccione	clear Congress (C)July 22 76 Nuclear fuels—on-site fabrication and reprocessing favored (C)Apr. 15 81
marketable (N)	44	Fresh water from vapor-compression evaporation. P. J. Brennan.Oct. 14 *170	Nuclear reactor fuel produced by high- energy compaction process at G-E (C)
World trade flourishes for nitrogen	94	Hafnium: hardest element to isolate—flowsheet. Eugene Guccione. Feb. 18 *128	Petroleum fuels plagued by microbes
goods (N)	38	Helium—New approach to recovery of helium from natural gas. Eugene	and surfactants (N)June 10 °104 Plutonium used as fuel in power re-
Acrylic emulsion finish for fibers,		Guccione	Rocket fuels see Rocket Propellants
fabrics	62	synthesis of ion-exchange resins. Eugene Guccione	Fuel Cells Aerospace gets new solid-electrolyte
pacted into solid cores (C) May 13 Dacron—Simple chemicals take tortu-	88	top cryogenic fluids. Eugene Gucci-	cell (N)
ous route to Dacron-flowsheet	•76	New look in air separation plants, Eu-	fuel cells all-day session (C) June 10-83, (N)June 24 54
Eugene Guccione Orofil—Rohm & Haas' acrylic elastomer fiber (C) June 10 Plants—semiannual inventory of new	81	gene Guccione	Fuel cell ready for maiden spaceflight (N)
plants and facilitiesApr. 15-169,		gasse. Bruce Cross Feb. 4 *74 Phosphoric acid—IMC's new plant shows off latest know-how. C. R.	proaches under study (C) Sept. 30 33
Polyester and glass fibers make new	133		G-E's low temperature cell has novel electrode structure (C)May 13 86 Miniature methane reformer makes
bids for tire-cord market (C).Oct. 14 Polyester cord may be new tire-cord	85	Platinum—Recovery of platinum metals still challenges engineers. Gouldsmith & Wilson. Nov. 25 *90	hydrogen for two-step cell (C)
contender (C)	79 32	Polaris gets improved fuel from new	Fungicides—Nontoxic, long-lasting fungi-
Monsanto's Chemstrand (C). Sept. 2 Polypropylene—dyeable propylene from	104	nitroplasticizers at Aerojet. Eugene Guccione	Furnaces
Polypropylene fiber from U. S. Rub-	104	ium within industry reach. W. H.	Basic oxygen furnaces spark steel modernization (C)Apr. 15 84
	*94	Davenport June 24 *86 Rocket propellants — Chemical-me- chanical process packs solid rockets'	Blast furnace productivity booster—ex- perimental process injects 50-50 coal- oil slurry (C)
Polypropylene yarn dyesApr. 29 Polypropylene yarns (vinylons) pro-	40	purch. Eugene Guccione Mar. 18 *156 Rubber—Old SBR line stretched to	oil slurry (C)
duced in Poland (N)Dec. 23 Synthetic fiber makers ride off in all	42	make stereo rubber. F. C. Price Jan. 21 84	Rotating furnace makes pig iron (C) Nov. 25 50
	*53	Separating glass sand from clay C B	
Terephthalic acid route to polyester fibers gets Japanese plant (C).July 8	63	HavighorstJune 10 *158 Silver nitrate from new plant: 99,9999 percent pure. Eugene Guccione	G
ilament Winding — Filament-wound tanks built in place by new Justin		Aug. 5 *86 Thermal dealkylation for Canada's cy-	Gages—Durometer can measure coating thickness on steel. E. C. Fetter
method	210	clohexane plant. Eugene Guccione July 22 *112	(P.N.) Dec. 23 *102
Concept-coordination indexing for per- sonal files-Information retrieval re-	1	luidization—Courtaulds viscose plant uses fluidized system to recover car-	Acetone removes carbon dioxide in new gas-cleanup process (N).July 8 86
	73	bon disulfide (C) Mar. 4-31, (chart) (N)	Air separation plants get new look— flowsheet. Eugene Guccione .Sept. 16 •150
sonal files—questions and answers July 8 *1	15	luids Estimating transfer coefficients in	Distillate reforming, hydrogenation produce fuel gas in England (C)
lm GuideJuly 8-202, Dec. 9 2	44	fluids. Calvert & Kapo (charts)	Feb. 18 79 Extraction of low-boiling gases by se-
Riofilter is first of its kind for Gulf	06	Pressure drop in long viscose-fluid pipe-lines. K. Lothholz W. (charts)	lective adsorption—Canadian process (C) Sept. 30 33
Coast oil refining (N)Dec. 9 *1 Filter media—report. R. C. French (tables)Oct. 14 *1	77 1	Jan. 7 89	Florida gets first gas plant (N) Jan. 21 *66
GlossaryOct. 14 1	78 79	Ebolon—black resin tops Teflon's wear resistance	German vacuum degassing unit now available to U. S. steel makers (C) Sept. 30
Filter medium—porous material made	89	Japanese maker of Polyflon resins	Hydrogen made by naphtha reforming —boon to gas-poor countries (chart)
of metal powdersDec. 9 *1 Liquid filtration—clearing up some	14	Fluorine—Aerospace tests woo fluorine	(N)June 24 *42
misconceptions. C. A. Jahreis (charts)	37 F	(N)	Industrial gases: a current look at three (charts) (N)Jan. 7 30
Micro-Floc clarification process uses dual-purpose filter (chart) (N)		Additive prolongs whiteness of ure- thane foams	Industrial gases lead inorganics par- ade—CPI review and forecast report
May 13 *	90	Aniline-based polyisocyanates gain in	Jan. 21 *98

		The Assert Property of the New York and a feet of
Inert-gas systems: a roundup. E. J. Funk, Jr. (charts & table). Oct. 28 *11	Scheduling heat exchanger cleaning. K. H. Parekh (P.N.) Feb. 18 180	Hydrogen Peroxide—Canadian Industries' hydrogen peroxide process is fed by
Liquefied gases—changes sought in	Heat Transfer	sulfide from hydrocarbon gases (C)
ICC transportation regulations (C) Apr. 15 8	Boiling-predicting and using liquid-	Hydrogenation Dec. 9 83
Liquefied methane gets first commer- cial tanker and Canadian plant (C)	(charts)	Shell process for treating hydrocarbons sidesteps tube fouling (N). Jan. 7 44
cial tanker and Canadian plant (C) July 22 7	Cooling with seawater. Gus Heinemann June 10 188	Wax-making plant features catalytic
LPG-chemical outlets set LPG sales	Copper alloys for heat-transfer equip-	hydrogenation purification process (C)Sept. 2 25
Lurgi gas-from-coal expansions ending	ment. C. L. Bulow (chart & table) Mar. 4 *130	(0)
in Britain? (N)Dec. 9 10 Nomograph solves ideal-gas-law prob-	An inexpensive liquid heat-transfer	I
lems. William Shulman (P.N.)	unit. E. F. BuonannoJune 10 *240 Mist heat transfer—water desalting	Index of CE Cost Files for 1958 to 1963
Feb. 18 *17. Phillips will supply liquid propane for	method from England (N) Aug 5 60	Indexing Dec. 23 104
making town gas in Britain (C)	Molten salt for heat transfer. Voznick & Uhl (charts & tables)May 27 *129	Concept-coordination indexing for im-
Plastic pillows cushion gas-storage	renetration theory. Caivert & Kapo	proving personal files — report. Ralph CushingJan. 7 *73
problems (N)		Concept-coordination indexing-how to put the key-concept method to work
Sulfinol process uses sulfolane to pur- ify sour-gas streams (table) (N)	Feb. 4 *99 Evaluating transport coefficients	(tables)Jan. 7 87
Sept. 16 *7	Mar.4 *105	Concept-coordination—Questions and answers about key-concept indexes
Xenon trioxide synthesized at Oak Ridge (N)Apr. 15 10:	Relate filtration to heat transfer. G. Q. MartinJan. 21 *103	and niesJuly 8 *115
Gasoline Better mileage from new gasolines?	Thermal resistance of pipes and tub-	India—Fertilizer policy strives to right imbalance (N)Oct. 28 88
Dec. 9 30	ing. David Stuhlbarg (table) (P.N.) Nov. 25 132	Information Retrieval
The fifty percent tax on gasoline. R. G. Follis (QED) Oct. 14 25	Thin skin promises economic water desalting (chart) (N)Apr. 15 96	Concept-coordination—Questions and answers about key-concept indexes
Follis (QED) Oct. 14 25 Gasoline-from-coal pilot plant to be financed by Office of Coal Research	desalting (chart) (N)Apr. 15 96	and filesJuly 8 *115
(C)Sept. 30	Airlift for liquid heliumSept. 30 54	Information retrieval—report (charts & tables)
(C) Sept. 30 3: Unicracking-JHC—new catalytic proc- ess produces cleaner-burning gaso-	Extraction by selective adsorption— Canadian process (C)Sept. 30 33	Improving personal filing systems; starting a personal file; how to
line (C)	Linde's permeation technique has po-	use concept coordination. Ralph
Gels Spill-Away coagulates oil spills on waterJune 24 *6	fication (C)	Cushing
Generators	Liquid-helium plant will feature flexi- bility (chart) (N)July 22 *86	work
Compact generator dissociates am- monia to yield hydrogen for fuel-cell	National Helium's new approach: how	tion referral" service (N)Apr. 29 64
use (C)June 10 8	the world's largest helium plant re- covers helium from natural gas-	Microfilm file offers data on sources of
"Consolidated nuclear steam gener- ator" for marine propulsion (C)	flowsheet. Eugene Guccione Sept. 30 *76	equipment and supplies for CPI plants (N)
Jan. 7 21	Refrigeration system from Switzerland based on liquid-helium cooling (C)	Inorganic Chemicals
MHD generator enhanced by supercon- ducting magnet at Westinghouse (N)	Sept. 16 74	Gases lead the parade—CPI review and forecast reportJan. 21 *98 Plants—semiannual inventory of new
MHD and nuclear energy to team up?	isotope (N)	Plants—semiannual inventory of new plants and facilitiesApr. 15-164,
(N) Jan. 7 3: "Geonomy"—new science, new name.	World's largest cryogenic helium plant on stream at Liberal, Kan. (C)	Oct. 28 128
Vladimir Belousov (QED) Apr. 29 170	Aug. 19 82	Technology—14th inventory of new processes and technologyJan. 21 109
Germanium-Czechs offer know-how for	Herbicides—Dow herbicide, called Tor- don, to get new plant (C) Nov. 25 48	Technology-15th inventory of new
obtaining germanium from coal (C) Nov. 11 11	Hoppers-Hopper design up to date. C. A.	processes and technologyAug. 5 107 Insecticides—Keeping up with problems
Germany	Lee	in using pesticides (chart & table)
Plastics enjoyed banner year in 1962 (N)	eign sale (N)July 22 *92	Instruments
Plastics output; export-import pattern (table) (N)Aug. 19 90	Hydraulics Hydraulic transport of solids see	Analyzers—how to evaluate on-line process analyzers. Escher & Fraade
Glass	Pipelines Solids pipelines	
Coating of glass reflects solar energy Oct. 14 112	Hydrocarbons — Pyrolytic-cracking by- products upgraded by new process (C)	"Arc image test facility" measures temperatures to 5,000 F (N). Aug. 5 66
Corning makes bendable safety glass	Dec. 23 21	Automatic analyzers help ORSANCO
Corning's Chemcor process wins CE	Hydrochloric Acid Canadian hydrochloric acid process	fight river pollution (map) (N) Feb. 4 *48
achievement honors (chart). Nov. 11 233 Float glass-British process for mak-	extracts iron powders from low-	Corning Glass enters instrument business (C)
ing new type of flat glass licensed	Process to get pilot-plant test (C)	Device adds solids to reacting auto-
for U. S. (C)	May 13 83	claves. A. W. Billitzer (P.N.) Dec. 23 *100
tic properties (C)Aug. 5 4: Heat exchange in glass. C. K. Mc-	Control of ion migration reduces HC1 losses. Chen-Sian Huang (chart)	Direct digital control concept accepted
Ewen (tables)	(P.N.)	Hydrostatic testing device simplifies
Microballoons impart unique proper- ties to resin systems. Sent. 30 66	via HCl (C)Apr. 29 54	work-hardening of pipelines, process vessels (C)Jan. 7 26
ties to resin systemsSept. 30 66 Microballoons' new outlet: prefabri-	New outlets presage easing of HCl glut—end-uses, output, Frances Arne	Mass analyzer built for on-line process
Microballoons' new outlet: prefabri- cated foams (table) (N)Aug. 19 Separating glass sand from clay— flowsheet. C. R. Havighorst June 10 *158	(tables) (N)Oct. 28 *76	control (C)
flowsheet. C. R. Havighorst.June 10 *158	Hydroulkylation Cyclohexane plant in Canada uses	LeeJune 24 *99
Glass fibers make new bid for tire-	thermal dealkylation—flowsheet. Eu-	Process simulator—device for training operatorsJan. 7 *108
cord market (C)Oct. 14 85 Glass reinforcement for plastics. Feuer	gene GuccioneJuly 22 *112 Unidak catalytic process gets good re-	X-ray analyzer extends control scope of cement-plant computer (C)
& Torres (chart)July 22 168	sults at two plants (C)Apr. 1 22	Oct. 14 88
Insulation made of continuous glass filaments	Hydrogen ACS symposium (C) Sept. 16-69, 76;	Asbestos paper from Japan (C)
Thinner fiber leads to new fabrics (C)	(C)Sept. 30 31	Sept. 2 32
Glass Fibers see also Plastics — Rein-	Catalyst enhances ortho-to-para con- version of liquid hydrogen at Air	Costs—insulation costs for vessels—CE Cost File. T. N. Dinning (tables)
forced plastics Graphite	Products & Chemicals (C). May 27 62	Dyna-Quartz—new silica felt insula-
English graphite has low permeability	Catalyst, G-66, from Chemetron pre- sages big hydrogen-plant savings	tion
Graphite and carbon as engineering	(C)	Foamed plastic wire coating—patent awarded to Union Carbide process
materials. Morelli & Rusinko (tables). Dec. 23 *69	for rockets-flowsheet. Eugene Guc-	(C)Jan. 21 46 Glass—continuous glass filament in-
Great Britain	Generator dissociates ammonia to yield	sulation
Acrylonitrile will be made in Scotland by firm formed by British trio (C)	hydrogen for fuel-cell use (C)	Motor insulations—handy chart aids selection
Apr. 29 47	Hydrogen-from-coal costs via new	Powder-polyostan nowder called
CPI spending down, production rising (N) Feb. 18 100	routes (C)Sept. 16 76 Industrial gases: a current look	Alkanex, insulates electrical apparatus (C)
Plastics firms predict banner year in	(charts) (N)Jan. 7 31	Tape made of foil-backed material
1963 (N)	Linde's liquid hydrogen plant will be largest in U. S. (C)Feb. 18 77	International Federation of Automatic
rials by autogenous grinding (C)	Liquid hydrogen gets novel role as	Control-meeting in Switzerland
Gums Sept. 2 30	fuel for internal-combustion engine (N)	Inventory Control—Surplus inventories:
Dialdehyde vegetable gumsJune 10 108	Liquid hydrogen kept liquefied-goal	liquidate or retain? — CE Cost File Aug. 5 134
Natural gumMay 27 82	Miniature methane reformer makes	Ion Exchange
H	hydrogen for fuel cell (C)Nov. 11 115	Ion exchange: what's new, practical, important—report, A. W. Michal-
	Naphtha reforming processes may be boon to gas-poor countries (chart)	
Hafnium—Here's hafnium: hardest ele- ment to isolate—flowsheet. Eugene	(N)June 24 *42	Liquid ion-exchange system removes detergents from sewage wastes (C)
Heat Exchangers	Purification — pressure-swing adsorp- tion process yields high-purity H ₂	Resins—Synthesis of ion exchange
Controlling corrosion in carbon-steel tubes. H. F. Hinst (charts)Jan. 7 *110	(C)July 8 63 Purification route found as outgrowth	resins at Ionac-flowsheet. Eugene
tubes. H. F. Hinst (charts). Jan. 7 *110 Copper alloys for heat-transfer equip-	of fuel-cell research (C)Sept. 16 69	Guccione
ment. C. L. Bulow (chart & table)	"Slush" hydrogen proposed as more efficient space fuel (C)Sept. 2 25	process from Imperial Chemical In-
Glass heat-transfer equipment. C. K.	To run a taut oil refinery, keep track	dustries (C)
McEwen (tables)Sept. 2 *124	of hydrogen (table) (N)Dec. 9 94	Ireland—Diamond plant at Shannon is Europe's first (C)June 10 86

Iron Coal gasification process can be inte	1	Proposed rules for opening federal		Men and machines. J. N. Gorringe	155
grated with smeiting operations (N	7 +70	shale lands to private development (C)	71	Obstacles to job progress. F. A. Hol-	155
Copper-removal process ups value o Moroccan ore (N) Nov. 2 Iron powders extracted from low-grad	f = 60	lonitrile patent infringement (C) Nov. 11	117	Overseas enterprises—CPI problems in the emerging countries. G. C. Jones	744
Iron powders extracted from low-grad- ores by Canadian hydrochloric acid	9	Universal Oil Products license-secrets suit against Hydrocarbon Research	***	Remearch on old projects to aid deci-	*69
Iron powder extraction process from	1 47	(C)	84	The responsibility for decision J R	106
Canada to get pilot-plant test (C)	1 .	lations. J. E. Colman Mar. 4 Leadership — Guidelines for leadership.	*93	Rhamstine (CED)Oct. 28 1 Salaries of some top CPI executives	176
Rotating furnace makes pig iron in Swedish direct reduction process	1-	Auren UrisFeb. 18	166	(table)	118
(C)	50	Electroluminescence - sheet lighting	278	R. L. Dodds	200
charge technique (N) Sept. II	82	(QED)June 10 Sodium lamp — high-temperature so- dium-vapor lamp gives better light	-10	Greenewalt (QED)Feb. 18 2 What do bosses need from their fore-	211
Strategic-Udy direct reduction process tryout in Venezuela (C) Feb. 4-29 (N) Aug. 11 Irradiation—Fish kept ocean-fresh by	*96	(N)June 10 Lignite—Carbonization of lignite reaches	102	men? B. Von Der HeydtFeb. 4 1 What is your chance for promotion?	116
gamma irradiation (C)Aug.	48	commercial stage—flowsheet. S. V. Margolin	108	What is your chance for promotion? Conrad Berenson	
Aniline-based polyisocyanates gain in rigid foam use (C)Nov. 11	1	Lime Dolotect, dolomitic lime, extends life of		What's ahead for middle management?	196
Diisocyanate-transvinylene diisocyan-		furnace linings (C)Oct. 14 Research project to help steelmakers	90	Who will fill the vacation void? W. H.	176
Kaiser will build Louisiana plant for		(N)	82	Why Charlie can't leave at closing time.	
broducing polyisocyanates from ani- line (C)July 22	71	hydrated lime (P.N.)Sept. 2	*116	William Ruchti	250
Isotopes—Thermal diffusion recovers he- llum-3 isotope (chart) (N)Nov. 25	*64	Liquid-liquid extraction—report. Oberg & Jones (charts & tables)July 22	•119	U.S. sea-mining schedule? (C) Apr. 29	52
Chemicals loom big in Israel's economy	***	Use expansion coefficients for density calculations. S. H. Fishtine (P.N.)		Marketing Call for marketing R&D. W. S. Penn,	
(map) (N)Jan. 21 Solvent extraction process for recov-	*50	Sept. 2 Lithium—New route to lithium com-	112	Jr. (QED)	146
ering metals to get Chemetals' pilot plant (C)Dec. 9	88	pounds bypasses leaching step (C) Dec. 9	88	CPI problems in the emerging countries. G. C. Jones (table)Apr. 1 Rubber marketers join forces to win	*69
J		Aluminum surfaces lubricants called		Task force approach to marketing.	24
Japan		Aluminum yields to G-E's new organic	70	N. M. Draper (QED)Aug. 5	156
Nylon research seeks to make nylon by telomerization, (C)Feb. 18 Polyester fiber via direct terephthalic	84	lubricants (N)	100	Marshall and Stevens indexes of compara- tive equipment costs Jan. 7 143, Jan. 21 211, Feb. 4 159, Feb. 18 229, Mar. 4 198, Mar. 18 294, Apr. 1 162, Apr. 15 288, Apr. 29 222, May 13 287, May 27 216, June 10 369, June 24 199, July 8 238, July 22 227, Aug. 5 189, Aug. 13 218, Sept. 2 227, Aug. 5 189, Aug. 13 218, Sept. 2 327, Oct. 28 229, Nov. 11 443, Nov. 25 185, Dec. 9 291,	
acid route-Toyo plant on stream		achieves lowest frictionJan. 7 Dry lubricantApr. 1	50 46	Mar. 4 198, Mar. 18 294, Apr. 1 162, Apr. 15 288, Apr. 29 222, May 13 287,	
(C)July 8	63	Lubricating fluid withstands high tem- peraturesOct. 28	96	May 27 215, June 10 359, June 24 197, July 8 233, July 22 227, Aug. 5 189,	
K		Phosphate esters for lubricants July 22 Pyrazine derivatives being tested for	100	Aug. 19 252, Sept. 2 191, Sept. 16 301, Sept. 30 175, Oct. 14 327, Oct. 28 229,	
Ketones		high-speed aircraft (C)Sept. 16 Space-lubricant system from Westing-	74	Nov. 11 443, Nov. 25 195, Dec. 9 291, Dec. 23 10	167
German aldehyde technique can now make methyl ethyl ketone or acetone		Tungsten disulfide—dry lubricant	56	Mass Transfer Nomogram calculates permeability fac-	
(charts) (N)	48	Vacuum poses tough hurdle for space	98	tor. G. Narsimhan (P.N.)June 10 24 Penetration theory. Calvert & Kapo	342
opmental quantities (C)July 8	65	lubes (chart) (N)	*74	(charts) Estimating transfer coefficients	
Iron-process tryout at giant metallurgi- cal kiln in Venezuela (N)Aug. 19	*96	thesize lysine commercially (C) July 22	69	Feb. 4 *9 Evaluating transport coefficients	99
Rotary kiln may make metaphosphate marketable (N)	*62	M		Materials Mar. 4 *10	05
Analog simulation of reaction kinetics.	*104	Magnesium oxide—Fuel additive called Liqui-MagMay 13	110	Materials in combination. M. G. O'Neil (QED)	28
W. F. Wagner	89	Magnets Magnetic flour called Ceramagnet BG		New trends in engineering materials Brittle engineering materials. D. R.	
Weiss (charts)	0.0	Mar. 4 Superconducting magnet enhances MHD	60	Wilder (charts)	09
Ferdinand Rodriguez (charts & ta- bles)	159	generator at Westinghouse (N) Feb. 18	•96	W. R. Hibbard, Jr. (charts & tables)	
Predicting consecutive reactions J. S. Ratcliffe (charts) Sept. 30 Scale-up of chemical reactors. F. A.	101	Superconducting-magnet systems may shield future spacecraft (N)Aug. 5 Maintenance	60	Corrosion-resistant metals. L. W. Gleekman (charts)Nov. 11 *21 Graphite and carbon as engineering	17
Holland (charts & tables)Apr. 15 Tables, simplify analysis of non-iso-	•145	Air-pollution control systems—how to get the most efficient operation. Yo-		materials. Morelli & Rusinko	
thermal reactors, B. M. Fabuss & others (tables)	153	com & Wheeler (charts & tables) June 24	126	(tables) Dec. 23 *6 High-temperature metals. Ross &	97
_		Analog computer components and their	103	McHenry (charts & table). Nov. 25 *9 Low-temperature metals. Abraham Hurlich (charts & tables). Nov. 25 *16	
Labor		Are you in a rut in maintenance? C. M. Loucks	140	New Trends in Engineering Materials- joint CE-Battelle Conference	
Foremen's role in labor grievances and arbitration. J. W. Whittlesey.July 22	*158	Contract maintenance—a fresh look. Herbert Popper (tables)Apr. 1	104	Editorial	7 84
Key to labor harmony, J. H. Turner	276	Gulf Coast cold weather precautions	•48	Slate of experts (N)Aug. 19 *9 Highlights of program (N). Sept. 2 *4	98
Vacations-Who will fill the vacation		W. H. Richardson Oct. 14	216	Defense Dept. speaker's topic (N) Oct. 14 *10	
void? W. H. Richardson May 27 Laboratories—Safety in high-pressure re- search. E. L. Clark Mar. 18	•183	Maintenance painting, F. R. Chariton see Paints		Conference draws big turnout (N) Dec. 23 *8	
Lazers		Open-faced scaffold allows quick exit for dismantled column (P.N.) Apr. 15 Paperwork—"Minor-Maintenance" sys-	184	Materials Handling Adjustable balance wheel aids unrolling	
Liquid laser from General Telephone & Electronics		tem streamlines paperwork. R. L.		of material. E. F. Buonanno (P.N.) Nov. 25 *13	34
state laser (C)Nov. 11		Pigeon menace parried Apr. 1 Plant Engineering and Maintenance	112	Hydrated lime handling simplified with vibratory feeder (P.N.)	
Acrylic latex	96	Show announcedJan. 7	108	Iron-ore-handling system gets big lift	
New trends in latex markets and tech-	110	Show announcedJan. 7 Steam tracing unplugs air-transport system. G. E. Monroe (P.N.) Apr. 15	178	Materials handling and bulk packaging —report. Ayers & Rhodes (chart &	
nology—markets, producers (tables) Resin latexes outpacing rubber (N)		tions. J. E. TroyanMar. 4		tables)	
Rubber latexes—new products enter	*96	Management Computers in economic evaluation.		(N)	54
old markets (N)June 24 Self-curing latexSept. 16	100		129	Varied output dictates flexible plant	
A businessman looks at antitrust laws.		Educating tomorrow's managers. Con- rad Berenson	110	layout (chart) (N)Aug. 5 *5 Materials of Construction	
C. H. Greenewalt (QED)Dec. 9 Chlorine tank salvage—U.S. files dam-	227	arbitration. J. W. Whittlesey.July 22 *		Brittle engineering materials. D. R. Wilder (charts)	09
age suit (C)	36		166	Ceramic oxides. W. E. Hauth, Jr. (table)	85
Diamond Aikan suit claims Montecatini	82	How to run better meetingsSept. 16 • Industry turns teacher		(table)	
acetylene process doesn't work (C) May 13	83		134	Nov. 11 *20:	13
Du Pont drops acetal resins patent suit against Celanese (C)May 27	60	Training engineering technicians. G. L. BeiswingerMay 13 * Teaching engineers about computers.	191	Corresion-resistant metals, L. W. Gleek-	14
Engineer's reference libel suit settled for \$15,000 (C)	81	J. P. Laird	140	man (charts)	17
Federal action likely on air pollution? (N)Feb. 4	46	BrennanJune 24 Management as a process control prob-	121	water conversion plants. R. E. Moore Sept. 30 *124. (table)Oct. 14 22-	24
Olin Mathieson denies kickback charges on foreign-aid drug sales (C). Mar. 18	86	lem. Simon Ramo (QED)Oct. 14	256	Economics of long- vs. short-life materials—CE Cost File 73. J. R. Brau-	
Pesticides — federal study asks for tighter controls (C)June 10	0.0	Managing engineering projects—report. J. M. McLellanMay 13 •	157	weiler (charts)Jan. 21 12	28
tighter controls (C)June 10	81	J. M. McLellan		4	

FEP-Teflon linings protect vessels		Plants-semiannual inventory of new		Salary survey (chart) (C) Aug. 5 50, (charts & table)	9100
FEP-Teflon linings protect vessels against corrosion (C)Sept. 30 Fluorosint, ceramic-like plastic, resists	31	plants and facilities. Apr. 15 166, Oct. 28	130	Natural Gas	
higher temperatures (charts)Apr. 1	*114	Plastics-metal laminates Sept. 30 Platinum metals recovery requires	*58	Florida gets first gas extraction plant (N) Jan. 21	988
Glass—float glass, new type of flat glass, produced in Britain (C). Feb. 4 Glass heat-transfer equipment. C. K.		long, complex operations—flowsheet. Gouldsmith & WilsonNov. 25	*90	Frozen-earth storage project set for New Jersey (N)	28
McEwen (tables)	*124	Powder-magnetic flourMar. 4 Powders-superfine metal powders en-	60	Garrett develops new type of plant for liquefying natural gas (C)Nov. 25	45
& Torres (chart)July 22 Graphite and carbon as engineering	168	hance metals' properties (C). Aug. 19 Solvent extraction process for recover-	84	Plants—semiannual inventory of new	40
materials. Morelli & Rusinko (tables)	•69	ing metals to get pilot plant (C) Dec. 9	88	plants and facilities Apr. 15 168; Oct. 28	132
High-temperature metals. Ross & Mc-		Stripping solutionFeb. 18	106	Technology — 14th inventory of new processes and technologyJan. 21	111
Henry (charts & table)Nov. 25 Low-temperature metals. Abraham Hurlich (charts & tables)Nov. 25	*97	Technology — 14th inventory of new processes and technologyJan. 21	110	Technology — 15th inventory of new processes and technology Aug. 5	109
Hurlich (charts & tables)Nov. 25 Lucalox—metal-like, high-density ce-	*104	Technology — 15th inventory of new processes and technologyAug. 5	108	Natural Resources	
Lucalox—metal-like, high-density ce- ramic withstands high temperatures (C)	*44	Methacrylates—Isobutyl methacrylate Feb. 18	108	Raw materials: will U.S. have enough in 2000? (tables) (N)Apr. 15	88
Nonmetallics recognized — remarks by C. E. Swartz (QED)Feb. 4	142	Methane Air Products low-temperature process		in 2000? (tables) (N)Apr. 15 Use nature, don't abuse her—remarks by C. H. Sommer (QED)Jan. 21	200
Plastic replaces metal as core for solid	•72	for making synthetic methane (C)		Water report see Water Neon-Liquefaction plant puts neon	
Plastics for process industries use	206	Liquested methane gets first commercial tanker and Canadian plant (C)		among top cryogenic fluids—flow- sheet. Eugene Guccione Sept. 2	*68
May 13 Sprayable urethane for decorative and		July 22		Nickel-iron alloys cold-rolled to thin	
protective coveringsAug. 5 Mathematics	*70	Methyl benzophenone isomers in develop- mental quantities (C)July 8	65	films (C)Oct. 14	85
Chart estimates critical volume of com-	8170	"Buy Mexican" mandate will boost		Nickel plating for product purity. R. V. Hughson (table)Apr. 15 Spherical nickel powdersFeb. 4	*190
pounds. J. F. Kuong (P.N.). Apr. 15 Finding the log mean on the log-log	-178	country's CPI (N)Oct. 28 Pemex announces record budget for	82	Nickel Boride-Catalyst may extend po-	
slide rule. Niels Madsen (P.N.) Sept. 30	*118	1963 (N)Apr. 15	102	tential of fuel cells (C)Sept. 30	38
Optimization. A. H. Boas Pt 2 How to use Lagrange Multi-		Petrochemical push under way—capa- city, plans (table) (map) (N). Mar. 4	42	Imperial Chemical will build huge plant at Severnside (C)Aug. 5	48
pliersJan. 7 Pt 3 How search methods locate op-	*95	Mica For insulation, a new kind of mica		Phosphoric acid process uses nitric acid	45
timum in univariable problems Feb. 4	*105	Dec. 9 Wettable mica for use in paints. June 10	*110 112	to leach phosphate rock (C)Nov. 25 TVA signs firm to build nitric acid	79
Pt 4 Optimizing multivariable func-		Microballoons Prefabricated foams offer new market		plant (C)Feb. 18	79
tions	-91	—how Microballoons are made, end- uses (table) (N)		Air separation plants get new look—flowsheet. Eugene Guccione. Sept. 16	*150
namic programming (tables) Apr. 1	•85	Tiny glass spheres impart unique prop-		Industrial gases: a current look (charts) (N)Jan. 7	30
Slide rule for investment calculations Sept. 2	122	erties to resin systemsSept. 30 Minerals—Great Salt Lake may be	60	Liquid nitrogen freezing preserves fresh fruit (C)	48
Statistics see Statistics Measurements		"mined" by Lithium Corp. (C) Nov. 11	122	Nitrogen makes steel stronger in new	38
Aerosol method measures flow of gases.	4110	Mining Potash—one route to Canada's under-		German process (C)Mar. 4 Research in Britain suggests new met-	
R. W. Schneider (P.N.)Sept. 30 Density-gradient columns measure poly-		ground deposits? (C)Nov. 11	122	als-separation methods (C). June 24 World trade flourishes for nitrogen	38
mer samples (P.N.)Mar. 18 Temperatures to 5,000 F. measured	*200	Uranium glut makes Canadian mines cost-wary (N)Jan. 21	62	goods (N)	94
Toward more accurate tank-level gag-	66	Mixers Selecting propeller mixers. A. P. Weber		flowsheet. Eugene GuccioneApr. 1 Nitrous oxide now used for tracing pipe-	•62
ing. Coe & Scarbel (P.N.)Dec. 23 Meetings—How to run better meetings	98	(charts & tables)Sept. 2 Specifications — Write better mixer	*91	line leaks (C)Jan. 7	28
Sept. 16	*194	Specifications — Write better mixer specs. N. H. ParkerMay 27 Mixing — Charts find concentration of	*107	Celanese joins list of U.S. makers and marketers (C)	81
Melamine Electrolytic conversion of HCN—key to		oleum-sulfuric blends. Leonard Sha- piro (P.N.)	*****	Fiber makers ride off in all directions.	*52
Sohio's new route to melamine (C) Sept. 2	30	Models		Frances Arne (N)Nov. 25 Japanese to research making nylon by	
Sales recover after dip—end-uses		Models Architectural studies in papertoard May 27	*84	Japanese to research making nylon by telomerisation (C)Feb. 18 Monomer-cast nylon 6 promises big	84
Sales recover after dip—end-uses, growth (chart) (N)Nov. 11 Mercury Cells—redesigned cell yields		Models Architectural studies in papertoard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont	*84	Japanese to research making nylon by	
Sales recover after dip—end-uses, growth (chart) (N)		Models Architectural studies in paperboard May 27 Plants—pre-assembled modules hike engineering efficiency at Du Pont (N) Jan. 21 Plastic models sub for metals in stress	*84 *54	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22	84
Sales recover after dip—end-uses, growth (chart) (N)	*128	Models Architectural studies in paperboard May 27 Plants—pre-assembled modules hike engineering efficiency at Du Pont (N) Jan. 21 Plastic models sub for metals in stress studies (N) Apr. 29 Molasses —Wood-based molasses called	*84 *54 *64	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon 8 promises big future for caprolactam. Frances Arne (N) July 22	84
Sales recover after dip—end-uses, growth (chart) (N)	*128	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon 6 promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican	84
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N) Jan. 21 Plastic models sub for metals in stress studies (N) Apr. 29 Molasses — Wood-based molasses called Masonex (C) Oct. 14 Molding Blow-molded and thermoformed resins	*84 *54 *64 83	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon 6 promises big future for caprolactam. Frances Arme (N) July 22 Olils and Fats Cotton seed processing at Mexican plant uses every hyproduct—flow—plant uses every hyproduct—flow—	84
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon 6 promises big future for caprolactam. Frances Arne (N) July 22 Other for approlactam frances Arne (N) July 22 Other for approlactam frances Arne (N) July 22 Other for approlactam frances are plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4	*78
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268	Models Architectural studies in paperboard Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon 6 promises big future for caprolactam. Frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 22 Other for approlactam frances Arne (N) . July 24 Tung oil—U.S. supply hits lowest level (N) . Apr. 15	*66
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268 214	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability Tung oil—U.S. supply hits lowest level (N) Apr. 18 Zenith process from Sweden for refis	*66 38
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268 214 40 70	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability Ting oil—U.S. supply hits lowest level (N) Apr. 15 Zenith process from Sweden for refining edible oils (C) May 13 Jeffins—French process simplifies synthe-	*66 38 102
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268 214 40 70 *203	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4 Tung oil—U.S. supply hits lowest level for the form of the process from Sweden for refining edible oils (C) May 13 Olefins—French process simplifies syntassis of conjugated diolefins (C) July 8 Operations Research—Economic evalua-	*66 38 102 83
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & Uure. W. R. Hibbard, Jr. (charts & Uure. W. R. Hibbard, Jr. (charts & Coating boosts billet yield (N). June 24 Corrosion detective's casebook. T. M.	*128 *88 268 214 40 70 *203 *52	Models Architectural studies in paperboard Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) May 13 Tung oil—U.S. supply hits lowest level to the companies of the companies	*66 38 102 83
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells — redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Conting process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once over (1). Composition of the future, W. R. Hibbard, Jr. (charts & tables) Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18	*128 *88 268 214 40 70 *203 *52 *122	Models Architectural studies in paperboard Mry 27 Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon 6 promises big future for caprolactam. Frances Arne (N) . July 22 Other for approlactam. Frances Arne (N) . July 22 Other for approlactam. Frances Arne (N) . July 22 Other for approlactam. Frances Arne (N) . July 22 Other for approlactam. Frances Arne (N) . July 22 Other for approlactam. Frances Arne (N) . July 22 Other for approlactam. July 22 Other for approlactam. July 23 Other for approlactam. July 24 Tung oil—U.S. supply hits lowest level (N) . Apr. 15 Zenith process from Sweden for refining edible oils (C) . May 13 Other for approlactam (C) July 30 Other for approlactam (A) . Apr. 29 Other for approlactam (A) . Apr. 29 Other for approlactam (C) . July 30 Other for approlactam (A) . Apr. 29 Other for approlactam (C) . July 30 Other for approlact	*66 38 102 83 68
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells — redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Apr. 15 Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once-over (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Soc. 11 Continuous steel-casting benchique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Pet. 18 More case: Metals by acetic acid. Sciench process metals by acetic acid.	*128 *88 268 214 40 70 *203 *52 *122 *186	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N) — Jan. 21 Plastic models sub for metals in stress studies (N) — Apr. 29 Molasses — Wood-based molasses called Masonex (C) — Oct. 14 Molding Blow-molded and thermoformed resins rising fast (N) — Sept. 30 Blow-molding of plastics is faster with new cooling process (N) — Dec. 25 Liquid carbon dioxide used for cooling blow-molded plastic parts upo output of molding machines (C) — Dec. 9 Plastics—better fabrication boosts sales —screw injection, powder molding, blow molding. Frances Arms (N) Phenolic molding resins will compete with metals (C) — 24 Rotational molding boosts powered polyethylene (N) — Dec. 23 Teffon molding nocess powered peles 22 Teffon molding nocess powered	*84 *54 *64 83 42 36 88 *78 33 42	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flowsheet. P. J. Hennan Jan. 7 Mineral oils aid polymer workability (C)	*66 38 102 83 68
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268 214 40 70 *203 *52 *122 *186 *148	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hennan . Jan. 7 Mineral oils aid polymer workability (C) . Mar. 4 Tung oil—U.S. supply hits lowest level (N) . Apr. 15 Zenith process from Sweden for refining edible oils (C)	*66 38 102 83 68 129 *195
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells — redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Apr. 15 Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables) tools to silicon (Continuous steel-casting beaching boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Cost metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts) Nov. 11 Cracks under the microscope. D. T. Williams. May 27	*128 *88 268 214 40 70 *203 *52 *128 *148 *217	Models Architectural studies in paperbard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hennan . Jan. 7 Mineral oils aid polymer workability (C) . Mar. 4 Tung oil—U.S. supply hits lowest level (N) . Apr. 15 Zenith process from Sweden for refining edible oils (C)	*66 38 102 83 68
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized Apr. 15 silicon (C). Jue 24. Coatings for aerospace metals get onceover (N). Apr. 29. Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24. Corrosion detective's casebook. T. M. Krebs. Feb. 4. More cases Feb. 18. Corrosion of metals by acetic acid. Eisenbrown & Barbis (tables). Apr. 29. Corrosion-resistant metals. L. W. Gleek. Cracks under the microscope. D. T. Williams	*128 *88 268 214 40 70 *203 *52 *128 *148 *217	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olils and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability (C) . Mar. 4 Tung oil—U.S. supply hits lowest level (N) . Apr. 15 Zenith process from Sweden for refining edible oils (C)	*66 38 102 83 68 129 *195
Sales recover after dip—end-uses, growth (chart) (N)	*128 *88 268 214 40 70 *203 *52 *128 *148 *217	Models Architectural studies in paperbard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N) — Jan. 21 Plastic models sub for metals in stress studies (N) — Apr. 29 Molasses — Wood-based molasses called Masonex (C) — Oct. 14 Molding Blow-moided and thermoformed resins rising fast (N) — Sept. 36 Blow-moiding of plastics is faster with new cooling process (N) — Dec. 29 Liquid carbon dioxide used for cooling blow-moiding plastics parts upo output of moiding machines (C) — Dec. 9 Plastics—better fabrication boosts sales —screw injection, powder moiding, blow moiding. Frances Arms (N) Phenolic moiding resins will compete with metals (C) — June 24 Rotational moiding resins will compete with metals (C) — June 24 Rotational moiding boosts powdered sizes, intricate shapes — July 22 Molecular Sleves—Boove and Molex proc- gents (C) — Sept. 16 Molybdenum Molybdenum Mar. 4 Miledes star as protective coatings for molybdenum — Mar. 4 Silicides star as protective coatings for molybdenum — Mar. 4	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) Mar 13 Tunot oil—U.S. supply hits low-lared for refining edible oils (C) May 13 Zenith process from Sweden for refining edible oils (C) May 13 Operations Research—Economic evaluation via computers. Thorne & Wise (charts & tables) Apr. 25 Optimisation Dynamic programming for optimizing multistage processes. Mitten & Nemhauser (charts & tables) Apr. 25 Optimisation. A. H. Bons (tables) Pt 2 How to use Lagrange Multi-ry 13 How search methods locate optimum in univariable problems Feb. 4 Pt 4 Optimizing multivariable func-	*66 38 102 83 68 129 *195
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Apr. 15 Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once-over (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. Teb. 4 Krebs. Feb. 18 Corrosion detective's casebook. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Aug. 19 Electrocladding of refractory metals	*128 *88 268 214 40 70 *203 *52 *122 *128 *148 *217 *154	Models Architectural studies in paperboard Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N) — Jan. 21 Plastic models sub for metals in stress studies (N) — Apr. 29 Molasses — Wood-based molasses called Masonex (C) — Oct. 14 Moding Blow-moded and thermoformed resins Plow-moding fast (N) — Sept. 30 Hlow-moding of plastics is faster with new cooling process (N) — Dec. 23 Liquid carbon dioxide used for cooling blow-moded plastic parts ups output of moiding machines (C) — Dec. 9 Plastics—better fabrication boosts sales —screw injection, powder molding, blow modiding Frances Arne (N) Phenolic molding resins will compete with metals (C) — June 24 Rotational molding boosts powdered polyethylene (N) — Dec. 23 Tefion moiding process produces large sizes, intricate shapes — July 22 Molecaes provede parafins for soft deter- gents (C) — Sept. 16 Molybdenum Molybdenum alloy called MTC — Feb. 4 Silleides star as protective coatings for	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C)	*66 38 102 83 68 129 *195 *95
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells — redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Conting process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once over (Nov. 11) Composition of the future. W. R. Hibbard, Jr. (charts & tables) W. R. Hibbard, Jr. (charts & tables) Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 25 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractory metals (C). Oct. 28 Explosive cladding process from Due Pont bonds dissimilar metals (C)	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 96 74	Models Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58	Japanese to research making nylon by telomerization (C) . Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) . July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) . Mar. 4 Tung oil—U.S. supply hits lowest level and the company of the compan	*66 33 102 83 68 129 *195 *95 *95 *97 *85
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Conting process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). June 24 Contings for aerospace metals get onceover (N). R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 25 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractor NASA (N)	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 96	Models Architectural studies in paperboard Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4 Tung oil—U.S. supply hits lowest level ing edible oils (C). May 13 Cotton process from Sweden Aprellation of Conjugated diolefins (C). July 8 Operations Research—Economic evaluation via computers. Thorne & Wise (charts & tables) Apr. 23 Optimisation Dynamic programming for optimizing multistage processes. Mitten & Nemhauser (charts & tables) Oct. 14 Optimization. A. H. Boas (tables) Pt 2 How to use Lagrange Multipliers Jan. 7 Pt 3 How search methods locate optimum in univariable problems 4 t 4 Optimization via linear and dynamic programming multivariable functions Mar. 4 Pt 5 Optimization via linear and dynamic programming Apr. 1 Trouble-shooting the uncontrolled variables, A. H. Bobs (charts) Mar. 18 Organic Chemicals	*66 33 102 83 68 129 *195 *95 *95 *97 *85
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Conting process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). June 24 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion detective's casebook. T. M. Krebs. Feb. 4 Corrosion detective's casebook. T. M. Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 25 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractory metals (C) June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C) June 10 88, (C) Oct. 28 Explosive cladding process from pickeliron alloys for electronic applications (C). Oct. 14	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 96 74	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N)	*66 33 102 83 68 129 *195 *95 *95 *97 *85
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once-over (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Continuous steel-casting boosts billet yield (N). June 24 Corrosion detective's casebook. Feb. 4 More cases. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Aug. 19 Electrocladding of refractory metals (C). Oct. 28 Explosive cladding process from D. Pont bonds dissimilar metals (C). Service of the control of the c	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 -67 85	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4 Tung oil—U.S. supply hits lowest level (N) Mar. 4 Tung oil—U.S. supply hits lowest level (N) Mar. 6 Centify process from Sweden for refinition of the control	*68 33 102 83 68 129 *195 *95 *185 69
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get once-over (N). Apr. 25 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Continuous steel-casting boosts billet yield (N). June 24 Corrosion detective's casebook. Feb. 4 More cases. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Aug. 19 Electrocladding of refractory metals (C). Oct. 28 Explosive cladding process from D. Pont bonds dissimilar metals (C). Service of the control of the c	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 67 85 196	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N)	*66 33 102 83 68 129 *195 *95 *97 *85 69 130
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized Apr. 10 silicon (C). June 24 Coatings for aerospace metals get onceover (N). Apr. 29 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Bleek. More cases for the microscope. D. T. Williams Cracks under the microscope. D. T. Williams of research program for NASA (N) Aug. 19 Electrocladding of refractory metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du High-intensity-are process yields refractory metals (C). Apr. 15 High-temperature metals. Ross & Mc-	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 -67 85 196 86	Models Architectural studies in paperboard Architectural studies in paperboard May 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C)	*66 33 102 83 68 129 *195 *95 *185 69 130 107
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized against of the following of the colling of the future. Apr. 12 Conting process uses fluidized against of the future. W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Eisenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleek. More cases for million of research program for NASA (N) Library (Cracks under the microscope. D. T. Williams May 27 Cracks under the microscope. D. T. Williams (C). Oct. 28 Explosive cladding of refractory metals (C). June 19 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C) June 19 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C) High-intensity-are process yields refractory metals (C). Apr. 15 Films—cold-rolled thin films of nickeliton alloys for electronic application (C). Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C) High-intensity-are process yields refractory metals (C). Apr. 15 Films—cold-rolled (C). Apr. 16 Films—temperature metals. Ross & McHenry (charts & table). Nov. 25 Expering technique for making multi-	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 -67 85 196 86 *97	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N)	*66 38 102 83 68 129 *105 *95 *185 69 120 107 105
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Coating process uses fluidized bed of silicon (C) and the second of the future. Apr. 15 Conting process uses fluidized bed of silicon (C) coating process uses fluidized bed of silicon (C) and the second of the future. Apr. 29 Composites: materials of the future. Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Mov. 11 Cracks under the microscope. D. T. Williams trengthening theory—aim of research program for NASA (N). Aug. 19 Electrocladding of refractory metals (C) June 10 88, (C) Oct. 28 Explosive cladding process from Due pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome to hold dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome Due pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome Due pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome Due pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process yields refractory metals (C). Apr. 16 Fletchemperature metals. Abraham utilians of process (C). Apr. 16 High-intensity-arc process yields refractory metals (C). Apr. 16 High-intensity-arc process yields refractory metals (C). Apr. 16 Layering technique for making multi-wall vegsels (C). Apr. 10 Layering technique for making multi-wall vegsels (C). June 20 Layering technique for making Abraham utilians desired for making multi-wall vegsels (C). June 20 Layering technique for making Abraham utilians de	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 67 85 196 86 *97 35	Models Architectural studies in paperboard Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability of the control of	*66 33 102 83 68 129 *195 *95 *185 69 130 107
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized bed of silicon (C). June 20 Coatings process uses fluidized bed of silicon (C). June 20 Coating process uses fluidized bed of silicon (C). Nov. 11 Conting process uses fluidized bed of silicon (C). Nov. 11 Conting process uses fluidized bed of silicon (C). Nov. 11 Conting process uses fluidized bed of silicon (C). June 20 Composites: materials of the future. W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams Henricon Nov. 11 Cracks under the microscope. D. T. Williams (C). Nov. 21 Electrocladding of refractory metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Due Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Due Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process yields refractory metals (C). Oct. 14 Forming supersedes cutting. W. S. Glin (QED). July 8 High-intensity-arc process yields refractory metals (C). Apr. 16 High-demperature metals. Ross & McS. Leavtemperature metals. Abraham Hurlich (charts & tables). Nov. 25 Materials for seawater desalting plants.	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 67 85 196 86 *97 35	Models Architectural studies in paperboard Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58 *99 *105 46 183	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Brennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4 Tunnic J. Supply hits low-kability (C) Mar. 4 Tunnic process from Sweden for refining edible oils (C) May 13 Zenith process from Sweden for refining edible oils (C) May 13 Olefins—French process simplifies synthesis of conjugated diolefins (C). July 8 Operations Research—Economic evaluation via computers. Thorne & Wise (charts & tables) Apr. 25 Optimisation Dynamic programming for optimizing multistage processes. Mitten & Nemhauser (charts & tables) Oct. 14 Optimization. A. H. Bons (tables) Pt 2 How to use Lagrange Multiple Thomas except methods locate optimum in univariable problems The Computer of the programming for the processes of the processes and dynamic programming Apr. 27 Touble-shooting the uncontrolled variables. A. H. Bobis (charts) Mar. 18 Organic Chemicals Electrochemical route to organics gets commercial plant (C) Oct. 28 Plants—semianual inventory of new plants and facilities Apr. 15 1668 Technology—14th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technology—15th inventory of new processes and technology Jan. 21 Technol	*66 38 102 83 68 129 *105 *95 *185 69 120 107 105
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized bed of silicon (C). June 20 Coatings or aerospace metals get bed of silicon (C). Locke (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 25 Corrosion-resistant metals. L. W. Gleekman (charts). Mov. 11 Cracks under the microscope. D. T. Williams May 27 Dispersion strengthening theory and of research program for NAAug. 19 Electrocladding of refractory metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 25 Explosive cladding process from Du Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du Pont bonds dissimilar metals (C). Henry charts & tables). Nov. 25 Corrosion (C). Oct. 14 Forming supersedes cutting. W. S. Ginn (QED). July 8 High-intensity-arc process yields refractory metals (C). Apr. 16 High-temperature metals. Ross & Mc-Lenry (charts & tables). Nov. 25 Casting expessed (C). Nov. 19 Cont. 14 Cont. 19 Con	*128 *88 268 214 40 70 *203 *52 *186 *148 *217 *154 67 85 196 86 *97 35	Models Architectural studies in paperboard Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58 *99 *105 46 183	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) Mar. 4 Tung oil—U.S. supply hits lowest level and the second of the	*66 38 102 83 68 129 *105 *95 *185 69 120 107 105
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables) Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED) Conting process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). Charts & tables) W. R. Hibbard, Jr. (charts & tables) Compositions: materials of the Apr. 25 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion detective's casebook. T. M. Krebs. Feb. 4 More cases Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 25 Corrosion-resistant metals. L. W. Gleekman (charts) Nov. 11 Cracks under the microscope. D. T. Williams May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electrocladding of refractory—aim of research program for NASA (N) Electroc	*128 *88 268 214 40 70 *203 *52 *1186 *148 *217 *154 67 85 196 86 *97 35 *104	Models Architectural studies in paperboard Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58 *99 *105 46 183	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 July 23 July 24 July 25 July 26 July 36 July 36 July 37 July 47 July 47 July 47 July 48 July 49 July 48 July 49 Jul	*66 38 102 83 68 129 *195 *97 105 *97
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). Coating for aerospace metals get onceover (N). Mar. 18 W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractor, Aug. 19 Electrocladding of refractor, Aug. 19 Films—cold-rolled thin films of nickeliron alloys for electronic applications (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du. Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome process from Du. Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du. Pont bonds dissimilar metals (C). Henry (charts & tables). Nov. 25 Layering technique for making multi-wall vegsels (C). Apr. 15 High-intensity-arc process yields refractory metals (C). Apr. 16 High-intensity-arc process yield	*128 *88 268 214 40 70 *203 *52 *122 *186 *148 *217 *164 67 85 196 86 *97 35 *104 224	Models Architectural studies in paperboard Mry 27 Plants — pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58 *99 *105 46 183	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N) July 22 Olis and Fats Cotton seed processing at Mexican plant uses every byproduct—flow-sheet. P. J. Hrennan Jan. 7 Mineral oils aid polymer workability (C) May 13 Mineral oils aid polymer workability (C) May 13 Lead of the controlled of the controlled oils (C) May 13 Lead oils (C) May 14 Lead oils (C)	*66 38 102 83 68 129 *195 *97 105 *97
Sales recover after dip—end-uses, growth (chart) (N). Nov. 11 Mercury Cells—redesigned cell yields more chlorine at Olin Mathieson (N) Mar. 18 Metals Anodic protection against corrosion. Sudbury & Locke (charts & tables). Nov. 11 Breakthroughs needed to exploit western U.S. ores. E. H. Crabtree (QED). Coating process uses fluidized bed of silicon (C). June 24 Coatings for aerospace metals get onceover (N). Coating for aerospace metals get onceover (N). Mar. 18 W. R. Hibbard, Jr. (charts & tables). Nov. 11 Continuous steel-casting technique boosts billet yield (N). June 24 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion detective's casebook. T. M. Krebs. Feb. 18 Corrosion of metals by acetic acid. Elsenbrown & Barbis (tables). Apr. 29 Corrosion-resistant metals. L. W. Gleekman (charts). Nov. 11 Cracks under the microscope. D. T. Williams. May 27 Dispersion strengthening theory—aim of research program for NASA (N) Electrocladding of refractor, Aug. 19 Electrocladding of refractor, Aug. 19 Films—cold-rolled thin films of nickeliron alloys for electronic applications (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du. Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process prome process from Du. Pont bonds dissimilar metals (C). June 10 88, (C) Oct. 28 Explosive cladding process from Du. Pont bonds dissimilar metals (C). Henry (charts & tables). Nov. 25 Layering technique for making multi-wall vegsels (C). Apr. 15 High-intensity-arc process yields refractory metals (C). Apr. 16 High-intensity-arc process yield	*128 *88 268 214 40 70 *203 *52 *1186 *148 *217 *154 67 85 196 86 *97 35 *104	Models Architectural studies in paperboard Plants—pre-assembled modules hike engineering efficiency at Du Pont (N)	*84 *54 *64 83 42 36 88 *78 33 42 *100 69 58 *58 *99 *105 46 183 *196 *42	Japanese to research making nylon by telomerization (C) Feb. 18 Monomer-cast nylon & promises big future for caprolactam. Frances Arne (N)	*68 33 102 83 68 129 *195 *95 *105 69 130 107 105 *97 *150 84 82

Oxygen		Keeping up with problems in using		Reboiler production boosted 44%	
Air separation plants get new look- flowsheet. Eugene Guccione. Sept. 1	6 *150	pesticides—topic of California confer- ence (chart & table) (N)Mar. 18	90	Apr. 1 Phosphorite—Collier Carbon seeks to can-	
Industrial gases: a current lool (charts) (N)	K 7 30	ence (chart & table) (N)Mar. 18 Timber owners try "safer" pesticide, revert to DDT (C)Oct. 14	85	cel U.S. contract to recover phospho- rite nodules from sea floor (C)	
		Petrochemicals C ₄ petrochemicals ride on synthetic rub-		Apr. 29 Phosphorus—Plastics researchers favor	54
gen capacity (C)	g	ber-output, end-uses (table) (N)	30	phosphorus for flame retardance (C)	
(chart) (N)	0 -08	Chemical outlets set LPG pace (N) Feb. 4		Apr. 29 Photography—"Instant pictures" made from electrostatically charged plastic	
ards in oxygen service (C). Jan. 2	1 43	Mexico's big petrochemical push under	0.6	film at G-E (C)	81
P		way—capacity, plans (table) (map) (N)	42	key agent in green plant energy con-	
Packaging-Materials handling and bull	ic	Petrochemical expansion slackens—CPI review and forecast reportJan. 21	*92	version (C)	86
packaging—report Ayers & Rhode (chart & tables)	8	Petroleum Acetylene from crude oil via submerged		build phthalic plant at Arecibo (C) May 27	57
Packing How to size chevron or square packing		flame method (chart) (N)Oct. 14 Alaska's first modern commercial oil	92	Pigeons—Process operators parry pigeon menace	112
H. W. Hamm (chart) (P.N.)		refinery (N)	*44	Pigments Dainippon Ink's new process for mix-	
Polyethylene packing Aug. Pump packings—selection and main-	5 70	may have hit snag (C) Mar. 4 Automated pilot plant aids cracking at	38	ing pigments (C)	57
tenance J. J. Whalen (tables)		American Oil (chart & table) (N)		Silica pigment	
Paints Nov. 11		Biological process makes food supple-		Pipelines Coating battles pipeline corrosion	
Additive improves adhesionNov. 11 Baked-on paint yields 7-year wood	1	ments from oil at Esso (C)Jan. 7 British expert's cautious look at energy	21	Feb. 18	
Enamel resists high temperatures, cor-	- *98	needs (table) (N)Dec. 23 Canada's Athabasca sands—Great Ca-	32	European oil firms clash over EEC pipeline policy (N)Apr. 29	58
Heat-resistant paintAug.	5 72	nadian hits financing snag (C)' Oct. 28	74	Iron ore transportation by pipeline gets Canada study (C) Aug. 19	84
Industrial finishes: outer calm, inner boil (tables) (N)Feb. 18	P.	Canada's Athabasca sands—more applicants bid for rights (C) Jan. 7-21,		to N. Y. areaDec. 9	9.0
Latex—paint is top market for resin	1	(C) Feb. 4-29, (C)	36	Multipurpose pipeline planned for Can- ada (C) Oet. 28	
Maintenance painting F. R. Charlton (tables)	1	tion routes offered; chances for use dim (C)	48	Nitrous oxide used for tracing pipeline leaks (C)Jan. 7	28
Why paint? Oct. 25 When to paint Nov. 25	*158	Canada's Athabasca sands—Pan Ameri- can gets approval for experimental	***	Pipelines beckon solids slurries (N) May 13	
Surface preparation, paint applica-		operations (C)July 22 Chemicals from oil: an economic im-	74	Plastic pipe for natural gas goes over- head (N) Oct. 28	80
tion, and inspectionDec. 23 Trichloro-ethylene-thinned paint from	106	perative J E Wood (QED) Mar 18	233	Pressure drop in long viscous-fluid pipe-	80
Britain's ICI (C)Jan. 21 Urethane paints—consumption up (N)		Installations (N)	*100	lines. K. Lothholz W. (charts) Jan. 7	89
Palladium catalysts Sept. 16	96 100	Computers in oil refining—three new installations (N)		Radioactive tracers ease cleanout prob- lems (N)	48
Architectural studies in paperboard		Feb. 18 Ethylene-from-crude oil process li-	79	Solids pipelines. Condolios & Chapus (charts)	
May 27 Asbestos paper from Japan won't burn	*84	censed to Chemico by Badische Ani- lin (C) July 8	65	Transporting solid materials in pipe- linesJune 24	•93
at up to 950 F. (C) Sept. 2	32	European oil firms clash over EEC pipeline policy (N)Apr. 29	58	Designing solids-handling pipelines July 8	*131
Computer shutdown reveals new aware- ness of papermill problems (C)	47	Forecast—oil's next hundred years M. J. Rathbone (QED)'Oct. 28	177	Operating solids pipelinesJuly 22 Pipes	
Computers-where do they fit in paper-		Foundry coke from petroleum coke via		Area allocation for distribution pines	1.40
Filter media-report R. C. French (ta-		Pacific Clay process (C) July 22 Hooverfining, formerly called Nalfining.	76	H. W. Cooper (P.N.) Oct. 28 Correction Dec. 23	148
bles)	*177	process for upgrading distillates (C) Oct. 14	88	Asbestos-cement piping with polyester lining gets test (N)Oct. 28 Bonding process for making lined or	*88
flowsheet Bruce Cross Feb. 4 Paper mills share waste plant (N)	*74	Humble Oil buys extensive Tidewater Oil facilities (C)Dec. 23	28	Bonding process for making lined or coated pipe gets N.J plant (C)	
Sant 9	*42	Largest U.S. refineries spotlighted by survey (table) (N)Sept. 2	38	Nov. 25 Carbon-steel pipe with improved prop-	43.
Sizing—fluorocarbon sizing for paper July 8	*90	LPG—chemical outlets set LPG sales pace (N) Feb. 4	52	erties (C)Oct. 14 Extruding a plastics sheath over steel	83
Enjay plant will use new Esso process		Mexico's Pemex announces record budget for 1963 (N) Apr. 15	102	pipe (N)	*34
for recovery of linear paraffins from refinery streams (C)Dec. 9 Equations find physical constants for	85	Microbes and surfactants plague dis-		Joints—huge sliding joints for relief (N)Dec. 9	*98
normal paraffins, S. H. Fishtine		Petroleum to make desert bloom? (N)		Masking-tape detector helps foil flange leaks (P.N.)	102
(P.N.) Isosiv and Molex processes provide	164	Plants—semiannual inventory of new plants and facilitiesApr. 15-168,	88	Plastic pipe of modified polyethylene, called Cab-XL (C)Aug. 19 Polypropylene pipe's first plant will	77
Sept. 16	69	Oct. 28	132	use Avisun resin (C) Feb. 4	34
Radiation wins role in Rumanian proc- ess for paraffin oxidation (C)		Resins—thermoplastic petroleum resins May 27	86	Teflon tape speeds pipe assembly Jan. 7	52
Patents Feb. 18	77	Shale lands—proposed rules to open federal land to private development		Tin plating wins fresh use for oil-drill pipes (N)	*96
Catalog of U.S. patents—first four volumes issued (C) Aug. 19 Dunlop Rubber and Montecatini will	82	(C)	71	Plant Design	
Dunlop Rubber and Montecatini will	84	spills on waterJune 24 Technology—14th inventory of new	•60	Mobile oxygen plants—engineering fea- tures of Air Product's small units	*58
exchange patents on elastomeric polymers (C)Feb. 18 Du Pont and Montecatini to share	84	processes and technologyJan. 21	111	(chart) (N)	
polypropylene patents (C)June 24	33	Technology—15th inventory of new processes and technologyAug. 5	109	ing efficiency (N)Jan. 21 Varied output dictates flexible layout	*54.
Du Pont drops acetal resins patent suit against Celanese (C) May 27 Engineers' group seeks to end employ-	60	Terminal loading time cut to 15 min- utes (N)July 22	94	(chart) (N)	*56
Engineers' group seeks to end employ- ers' pre-emption of patent rights (C)		Tie-in upcoming for oil and chemical	36	flexible layout at netroleum-additives	*56
EPT rubber—Dunion Canada may get	79	giants? (N)	94	plant (chart) (N)Aug. 5 Plant Location—Deer Park, Tex., experi- ences rampant expansion (C)	
basic U.S. patent (C)Feb. 4 Exclusivity still prized. Samuel Lenher	29	World Petroleum Congress—a multi- process boost for oil technology (N)		Plant Notebook	122
(QED)	173	July 8 World Petroleum Congress plans set	*72	Adjustable balance wheel aids un- rolling of material. E. F. Buonanno	
on blowing agents (C)July 22	69	(N)	54	Nov. 25	•134
Government patent policies on feder- ally-financed research (C)Oct. 28 Mobil Chemical buys Olin Mathieson	69	Dow toluene-to-phenol route has no by-		Adjustable restriction accurately con- trols flow. W. H. GriesJan. 21	*134
patents related to making polyester		product disposal problem (C) . Apr. 1 Phenol-from-cumene process involved	17	Aerosol method measures flow of gases. R. W. SchneiderSept. 30	
fibers and films (C)Feb. 18 Sohio denies Distillers' charges of acry-	77	in patent suit licensed to ICI by UOP (C)	90	Area allocation for distributor pipes. H. W. Cooper (chart & table)	
lonitrile patent infringement (C) Nov. 11	117	UOP (C) Dec. 9 Scientific Design benzene oxidation process for producing phenol (C)		Oct. 28 Correction	148
Surplus patents go to market (N) June 10	92	Phosphoric Acid Dec. 9	85	Automatic level controller for powders. L. M. Folentz	116
Union Carbide Plastics awarded patent		Controlled crystallization process from			
on production of foamed thermoplas- tic wire insulation (C)Jan. 21	46	(N)	76	Caustic seal protects pumps in acid	119
Penetration Theory Penetration theory Calvert & Kapo		tion-flowsheet Eugene Guccione	***	Bigger cash prizes ofered authors in 1964. Nov. 25 Caustic seal protects pumps in acid gas service. Dent liss	9170
(charts) Estimating transfer coefficients		Dow Chemical process will get pilot	*92		-178
Feb. 4 Evaluating transfer coefficients	*99	plant in Sarnia, Ont. (C)Oct. 28 Dow Chemical's small pilot plant	67	sulfuric blends. Leonard Shapiro May 13	•200
Mar. 4 Peroxide—organic peroxide catalyst	105	Dow Chemical's small pilot plant studying production of phosphoric acid from HCI (C) July 8	70	Chart simplifies tubular reactor design	130
Pesticides May 13	110	acid from HCI (C)July 8 IMC's new plant at Bonnie, Fla., shows off latest phosphoric know-how—flow-		R. C. Schwing (chart) Aug. 5 Comparison of flashing-valve sizing methods. E. J. Lapadula (charts &	
Facts and fallacies of "Silent Spring."	146	sheet. C. R. BanfordMay 27 * Nitric acid leaches phosphate rock in	100	tables)	128
R. White-Stevens (QED) Feb. 4 Federal study asks for tighter controls	146	new phosphoric acid route (C)		losses. Chen-Sian Huang (chart)	100
(C)June 10	81	Nov. 25	45	July 8	162

Delta equations speed up concentra-					
at the state of th		Butadiene plant makes ocean trip to	92	Plants—semiannual inventory of new plants and facilities. Apr. 15-169,	
tion calculations. Leonard Shapiro (table)Oct. 28	150	Brazil (N)July 22 California's pioneer nuclear power unit starts up (N)Oct. 28		Oct. 28	133
polymer samples	*200	unit starts up (N)Oct. 28 Costs—Economic evaluation of R&D projects. A. J. Weinberger see	*82	Plastic models sub for metals in stress analysis studies (N)Apr. 29	*64
Design of vessels under external pres- sure. H. W. Hamm (charts). Sept. 30	114	projects. A. J. Weinberger see		Plastics boom continues—CPI review and forecast report Jan. 21	*94
Device adds solids to reacting auto-	***	Costs short-out method for plant	208	Plastics Exposition reveals new prod-	85
Device adds solids to reacting auto- claves. A. W. BillitzerDec. 23 Device yields true sample from vary- ing gas flow. W. H. GriesAug. 5	•100	costs—CE Cost File (charts). Mar. 18 Goodrich "research factory"—step be-	200	ucts and processes (C)Dec. 9 Polyimides: tough, high-temperature	
	*132	tween lab and pilot plant (N) July 22	82	Production hits new record in 1962	*68
ness on steel. E. C. FetterDec. 23	*102	Hydrocarbon Chemicals' new petro- chemical complex at Bay, South		(table) (N)	41
ness on steel. E. C. FetterDec. 23 An easy way to estimate pH of weak acids or bases. R. K. Finn (charts)		Wales (N) Dec. 9 ICI's p-xylene plant boasts revamped	*108	new copolymer of propylene and	
Sept. 2 Equalizing line improves condenser op-	114	process (N)	82	ethylene (C) May 27 Reinforced plastics curb corrosion.	60
eration. Hans Westphalen (P.N.) Oct. 28	•150	new plants and facilities. Apr. 15-		Rigid thermoplastic sheetMay 13	206 112
Equation quickly scales reactor variables. Bernard KouselFeb. 18	180	Linde's giant liquid hydrogen plant	127		23
Equations find physical constants for	180	to be built by Kaiser Engineers (C)		premiur. properties (C)Jan. 7 Space bladder of fade-away "photolys-	
normal paraffins. S. H. Fishtine July 8	164	Feb. 18 Mobile energy depot to be designed for	77	able" film	*58
Equilibrium data for argon, helium, methane in ammonia. Isaacson &		AEC, Army (C)Apr. 15 Monsanto's Chocolate Bayou reflects	81	W. A. SeveranceJune 10 Technology—14th inventory of new	*248
Viens (charts)Jan. 21 Estimate number of plates from boil-	136	new thinking (N)Jan. 7 (N) Jan. 21	*36.	processes and technologyJan. 31 Technology-15th inventory of new	111
ing points. L. S. Bitar (chart)		Natural gas liquefying plant has only		processes and technology Aug. 5	110
Finding the log mean on the log-log	126	one moving part (C)Nov. 25 New ratios for estimating plant costs	45	Thermoformed and blow-molded resins rising fast—market forecast (tables)	
slide rule. Niels MadsenSept. 30 Gas impingers find dust load of water-	*118	(tables)	120	(N)Sept. 36	42
saturated gas. D. R. Ericson Sept. 30	*114	the emerging countries. G. C. Jones	*69	Nickel plating for product purity. R. V.	
Gravity feeder solves gummy problem. T. J. Tully	*196	Overseas enterprises-Estimating costs	0.0	Hughson (table)Apr. 15 Teffon plating process puts thin coating	*190
T. J. Tully	180	of plants abroad—CE Cost File (tables)July 8	168	Teffon plating process puts thin coating on metals (C)July 22 Tin plating wins fresh outlet in oil (N)	71
How to size chevron or square packing. H. W. Hamm (chart)Apr. 15	•180	petrochemical base (N)Aug. 5	*66	Dec. 9	*96
Improved design for acctone strippers.		Steel plant in Texas will be nation's		Platinum—Recovery of platinum metals requires long, complex operations— flowsheet. Gouldsmith & Wilson	
Mohammad Bashar (charts) Feb. 18 An improved hot well for vacuum	174	most advanced integrated facility (C)May 13	88	flowsheet. Gouldsmith & Wilson Nov. 25	*90
ejectors. M. FridmanJan. 21 An inexpensive liquid heat-transfer	*132	Plasticizers		Plutonium—Power reactor becomes first to use plutonium (N)Jan. 21	56
unit. E F. Buonanno June 10	*240	Additive permits shaping of rigid vinyl by plastisol methodsSept. 2	54	Poland—CPI developing new economic	
Least-squares method finds sets of constants. L. E. Marc de Chazal		Additive resists extraction by hydro- carbonsJune 24	60	Polish—Polishes throughout the world.	102
Masking-tane detector heins foil	160	High-molecular-weight additive for vinylsOct. 28 Nitroplasticizers improve Polaris fuel	96	Wolfgang Sapper (QED)Jan. 21 Politics—Let's tell our story. J. E. Hull	198
flange leaks	102	Nitroplasticizers improve Polaris fuel	*62	(QED)Sept. 16	226
grating. A. D. Scheiman Mar. 18	204	—flowsheet, Eugene Guccione.Apr. 1 Plasticizers for vinylsJuly 8 Resinous additive for vinylsOct. 28	92	Polybutadiene Cis-polybutadiene general-purpose rub-	
Nomograph solves ideal-gas-law prob- lems. William ShulmanFeb. 18	*178	Resinous additive for vinylsOct. 28 Soviet plasticizers, called Anaz, from	96	ber called Ameripol CB from Good-	70
lems. William ShulmanFeb. 18 Nuclear gaging system solves level- control problem (chart)July 8	160	Soviet plasticizers, called Anaz, from naphthenic acids (C)Sept. 2 Plastics	32	Cls-polybutadiene rubber available in oil-extended forms (C)July 22	
Open-faced scaffold allows quick exit	•184	Aluminum needles-plastics filler		Cis-polybutadiene rubber — Goodrich- Gulf's old SBR Line stretched to	71
Plastic pipe protects conveyor-belt		June 24 Austrian school for plastics technology	*62	make stereo rubber-flowsheet, F. C.	
Polyethylene film protects fume vent	*206	(N)	104	PriceJan. 21 Polybutene—New polybutene fron Cos-	*84
Polyethylene film protects fume vent from weather. E. J. Erwood. Sept. 30 Portable mechanical valve-operator.	*116	Oct. 28	*94	den	84
	*200	Better fabrication boosts sales. Frances Arne (N)July 22	*78	Polycarbonates—Lexan—two new lexan resinsAug. 19	168
Practical tips for removing oil and grease from water. C. A. Lee		Blanket of plastic balls reduces plating	*90	Polyesters Fan 7	62
(charts)	176	fumes (N)		Concrete developed in Russia uses	
bon beds. H. B. Allport (chart) Jan. 21	132	Owens-Illinois cooling process (N) Dec. 23	36	polyester resins instead of cement (C)Nov. 11	120
Correction	200	British producers predict banner year in 1963 (N)Oct. 28	9.0	Wihar makara side off in all disactions	*52
	*130	Ceramic-like plastic, called Fluorosint, resists higher temperatures (charts)		Frances Arne (N)	85
Quick calibration of horizontal cylin- drical tanks. Leonard & Muench		April 1	*114	MODII Chemical buys Onn Mathieson	9.0
Apr. 15	184	Chlorine plant's mist-eliminator is made of plasticApr. 1 Composites: materials of the future.	*118	patents related to producing poly- ester fibers and films (C)Feb. 18	77
					0.0
Quick-disconnect couplings save gas- metering costsJuly 8	162	W. R. Hibbard, Jr. (charts & tables)		Monsanto's Chemstrand will join U. S. fiber producers with plant in Ala.	
metering costsJuly 8 Silica concentration gives cooling-		W. R. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at		fiber producers with plant in Ala. (C)	32
metering costsJuly 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart)June 10	162 238	W. R. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C)Apr. 15		fiber producers with plant in Ala. (C)	
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart)		W. R. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement	°203 84	fiber producers with plant in Ala. (C)	32
metering costs July 8 Silica concentration gives cooling- water blowdown rate J. S. Heecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka July 8	238 238	W. R. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	°203 84	fiber producers with plant in Ala. (C)	32
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka July 8 Steam tracing unplugs air-transport system G. E. Monroe. Apr. 15	238 238 •158	W. R. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	°203 84	fiber producers with plant in Ala. (C)	32
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner June 10 Glasokar pressure extractor July 8 Steam tracing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in	238 238 *158 *178	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C)Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement with the control of the control of the control Dependent of the probed in the control term study (N)Sept. 16 Equipment—Selecting plastic equipment for chemical plants H. D. Bar-	*203 84 *235 82	fiber producers with plant in Ala. (C)	32 31 *210 63
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. July 8 Steam tracing unplugs air-transport system. G. E. Monroe. Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem-	238 238 *158 *178	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C)Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors to be probed in the short of the sho	*203 84 *235 83 *188	fiber producers with plant in Ala. (C)	32 31 *210
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner June 10 Single-stage pressure extractor. R. A. Gasoka ceing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2	238 238 *158 *178 *198	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	*203 84 *235 82	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner June 10 Single-stage pressure extractor. R. A. Gasoka ceing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2	238 238 *158 *178 *198	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	*203 84 *235 83 *188 *34	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka. July 8 Steam tracing unplugs air-transport system. G. E. Monroe. Apr. 15 Strap-on studs eliminate welding in tank insulation. May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June	238 238 *158 *178 *198 *118	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C). Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors. Nov. 11 Deterioration to be probed in long- term study (N). Sept. 16 Equipment—Selecting plastic equip- ment for chemical plants. H. D. Bar- ton. Aug. 19 Extruding a plastics sheath over steel pipe (N). Dec. 23 Flame retardance—phosphorus favored for use in self-extinguishing plas- tics (C). Apr. 29 Flame retardant cuts colorant cost	*203 84 *235 83 *188 *34	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka. July 8 Steam tracing unplugs air-transport system. G. E. Monroe. Apr. 15 Strap-on studs eliminate welding in tank insulation. May 13 System protects heat-sensitive chemical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub-	238 238 •158 •178 •198 •118	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C). Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors. Nov. 11 Deterioration to be probed in long- term study (N). Sept. 16 Equipment—Selecting plastic equip- ment for chemical plants. H. D. Bar- ton. Aug. 19 Extruding a plastics sheath over steel pipe (N). Dec. 23 Flame retardance—phosphorus favored for use in self-extinguishing plas- tics (C). Apr. 29 Flame retardant cuts colorant cost flame retardant cuts colorant cost German plastics had banner year in	*203 84 *235 82 *188 *34 47 58	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114 62 44
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple menod substantial con- Single-stage pressure extractor. R. A. Gasoka July 8 Steam tracing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemlich Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, Juno Thermal resistance of pipes and tub- ing. David Stuhlbarg (table) Nov. 25 Toward more accurate tank-level gag-	238 238 *158 *178 *198 *118 240 132	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	*203 84 *235 83 *188 *34	fiber producers with plant is Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- control of the control of the control of the con- strate of the control of the control of the control Steam tracing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhlbarg (table) .Nov. 25 Toward more accurate tank-level gag ing. Coe & Scarbel Dec. 23 Toward more accurate tank-level gag ing. Coe & Scarbel Dec. 23	238 238 *158 *178 *198 *118 240 132 98	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 82 *188 *34 47 58	fiber producers with plant is Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116 31
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- control of the control of the control of the con- strate of the control of the control of the control Steam tracing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhlbarg (table) .Nov. 25 Toward more accurate tank-level gag ing. Coe & Scarbel Dec. 23 Toward more accurate tank-level gag ing. Coe & Scarbel Dec. 23	238 238 *158 *178 *198 *118 240 132 98	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievement honors	*203 84 *235 82 *188 *34 47 58 34	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116 31
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Ganoka July 8 Steam tracing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studes eliminate welding to the system protects heat-sensitive chemical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemlich Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhlbar (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tucson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. 8. H. Fishtine. Sept. 2	238 238 *158 *178 *198 *118 240 132 98	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather— like material wins CE achievemen. In the material wins CE achievemen. In the synthetic leather— like material wins CE achievemen. In the synthetic leather— like material wins CE achievemen. In the synthetic leather— leather study (N)	*203 84 *235 83 *188 *34 47 58 34 90	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116 31
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Ganoka. Steam tracing unplugs air-transport system. G. E. Monroe. Apr. 15 Strap-on studs eliminate welding in tank insulation. May 13 System protects heat-sensitive them ical in pipeline Saphier & chem ical in pipeline Saphier & Rept. Test your CEQ. Robert Lemlich Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhlbarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel. Dec. 23 Tueson dentist performs Titanic ex- traction. Nov. 25 Use expansion coefficients for density calculations. 8. H. Fishtine. Sept. 2 A variable-flow, constant-pressure nozale, B. M. Johnson. June 10	238 238 *158 *178 *198 *118 240 132 98 *134 112	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather-like material wins CE achievement honors Nov. 11 Deterioration to be probed in long-term study (N) Sept. 16 Equipment—Selecting plastic equipment for chemical plants. H. D. Barton Aug. 19 Extruding a plastics sheath over steel pipe (N) Dec. 23 Plame retardance—phosphorus favored for use in self-extinguishing plastics (C) Apr. 29 Flame retardant cuts colorant cost of the colorant cost of	*203 84 *235 83 *188 *34 47 58 34 90 168 *106	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116 31
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka July 8 Steam tracing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Test your CEQ. Robert Lemith Jan. 21-136, Feb. 18-178, Mar. 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhbharg (table). Nov. 25 Toward more accurate tank-level gag- ing. Cee & Scarbel Dec. 23 Tucson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. 8 H. Fishtine. Sept. 2 A variable-flow, constant-pressure nozale, B. M. Johnson June 10 A venturi feeder for fluid-bed systems. Lee Jones Sept. 2 Sept. 2	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236	W. H. Hibbard, Jr. (charts & tables) Nov. 11 Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather- like material wins CE achievemen. It beterioration to be probed in long- term study (N) Sept. 16 Equipment—Selecting plastic equip- ment for chemical planstic equip- ment for chemical planstic average ment for chemical planstic value. Extruding a plastics sheath over steel pipe (N) Dec. 23 Flame retardance—phosphorus favored for use in self-extinguishing plas- tics (C) Apr. 29 Flame retardant cuts colorant cost German plastics had banner year in 1962 (N) Jan. 7 Germany's output, export-import, pat. German flores for plastics retinforcement. Feuer & Torres (chart) July 22 Glass flores for plastics retinforcement. Feuer & Torres (chart) July 22 Glass resins"—glass-like resins from Owens-Illinois (chart) Aug. 19 Hall, William N. on plastics for proc- ess industries use May 13 Khrushchev plays pitchman for plas-	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 206	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114 62 44 *116 31 96 50 70
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. July 8 Steam tracing unplugs air-transport system G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhibarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tucson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. S. H. Fishtine. Sept. A Variable-low Constant-pressure Lee Jones Sept. 2 Vibratory feeder simplifies hydrated	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236 *112	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 206 52	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63 *9: 114 62 44 *116 31 96 50 70 77 72
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka. Gasoka accing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhibarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tacson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. S. H. Fishtine. Sept. 2 A variable-flow, constant-pressure nozale, B. M. Johnson June 10 A venturi feeder for fluid-bed systems. Lee Jone deeder simplifies by drast density claust deneration.	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236 *112 *116	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 52 84	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114 62 44 *116 31 96 50 70
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka. Gasoka accing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhibarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tacson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. S. H. Fishtine. Sept. 2 A variable-flow, constant-pressure nozale, B. M. Johnson June 10 A venturi feeder for fluid-bed systems. Lee Jone deeder simplifies by drast density claust deneration.	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236 *112 *116	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather-like material wins CE achievement honors Nov. 11 Deterioration to be probed in long-term study (N) Sept. 16 Equipment—Selecting plastic equipment for chemical plants. H. D. Barton Aug. 19 Extruding a plastics sheath over steel pipe (N) Dec. 23 Plame retardance—phosphorus favored for use in self-extinguishing plastics (C) Apr. 29 Flame retardant cuts colorant Avr. 4 German plastics had banner year in 1962 (N) Jan. 7 Germany's output; export-import pattern (table) (N) Aug. 19 Glass fibers for plastics reinforcement. Feuer & Torres (chart) July 22 "Glass resins"—glass-like resins from Owens-Illinois (chart) Aug. 19 Hall, William N. on plastics for process industries use May 13 Khrushchev plays pitchman for plastics (N) Jan. 21 Laminate—elastomeric laminate May 27 Laminates—plastics-aluminum laminates in continuous sheets. Sept. 30	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 206 52	fiber producers with plant in Ala. (C) ————————————————————————————————————	32 31 *210 63 *9: 114 62 44 *116 31 96 50 70 77 72 42 104
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Stam facing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198. June Thermal resistance of pipes and tub- ing. David Stuhibarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tucson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. S. H. Fishtine. Sept. 2 Vibratory feeder simplifies hydrated lime handling lime handling simplifies hydrated lime handling of startups, shut- downs and emergency procedures W. H. Richardson Oct. 14 Sequence planning of startups, shut- downs and emergency procedures	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236 *112 *116	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather—like material wins CE achievement honors Nov. 11 Deterioration to be probed in long-term study (N) Sept. 16 Equipment—Selecting plastic equipment for chemical plants. H. D. Barton Aug. 19 Extruding a plastics sheath over steel pipe (N) Dec. 23 Plame retardance—phosphorus favored for use in self-extinguishing plastics (C) Apr. 29 Flame retardant cuts colorant cost of the control of the colorant cost of the color	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 52 84	fiber producers with plant is Ala. (C) ————————————————————————————————————	32 31 *210 63 *9; 114 62 44 *116 31 96 50 70 77 72 42
metering costs July 8 Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) June 10 Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Gasoka July 8 Steam tracing unplugs air-transport system. G. E. Monroe July 8 Steam tracing unplugs air-transport system of E. Monroe May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butche July 8 Test your CEQ Robert Sept. 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing David Stuhlbarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tueson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. 8. H. Fishtine. Sept. 2 A variable-flow, constant-pressure nozale, B. M. Johnson June 10 A venturi feeder for fluid-bed systems. Lee Jones Sept. Sept. 2 Vibratory feeder simplifies hydrated lime handling Sept. 2 Vilant Operation How to foresee operating difficulties. W. H. Richardson Oct. 14 Sequence planning of startups, shut- downs and emergency procedures Jan. 7	238 238 *158 *178 *198 *118 240 132 98 *134 112 *236 *112 *116	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C) Apr. 15 Corfam—Du Pont's synthetic leather—like material wins CE achievement honors Nov. 11 Deterioration to be probed in long-term study (N) Sept. 16 Equipment—Selecting plastic equipment for chemical plants. H. D. Barton Aug. 19 Extruding a plastics sheath over steel pipe (N) Dec. 23 Plame retardance—phosphorus favored for use in self-extinguishing plastics (C) Apr. 29 Flame retardant cuts colorant cost (C) Apr. 29 Flame retardant cuts colorant cost (S) Jan. 30 German plastics had banner year in 1962 (N) Jan. 30 Germany's output; export-import pattern (table) (N) Aug. 19 Glass fibers for plastics reinforcement. Feuer & Torres (chart) July 22 "Glass resins"—glass-like resins from Owens-Illinois (chart) Aug. 19 Hall, William N. on plastics for process industries use May 13 Khrushchev plays pitchman for plastics (N) Jan. 21 Laminate—elastomeric laminate May 27 Laminates—plastics-aluminum laminates in continuous sheets. Sept. 30 Market aimost double by 1970 (N) Aug. 19	*203 84 *235 83 *188 *34 47 58 34 90 168 *206 52 84 *58	fiber producers with plant is Ala. (C) ————————————————————————————————————	32 31 *210 63 *9: 1114 62 44 416 31 96 50 77 72 42 104
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. R. A. Ganoka. Steam tracing unplugs air-transport system. G. E. Monroe. Apr. 13 Strap-on studs eliminate welding in tank insulation. Apr. 13 System protects heat-sensitive Seph. 2 Test your CEQ. Robert Lemlich Jan. 21-136. Feb. 18-178. Mar. 18- 202. Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhlbarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel. Dec. 23 Tucson dentist performs Titanic ex- traction. Avariable-flow, constant-pressure nozale, B. M. Johnson. June 10 A venturi feeder for fluid-bed systems. Lee Jones W. H. Richardson. Oct. 14 Sequence planning of startups, shut- downs and emergency procedures Jan. 7 Using common senses in plant opera- tions. J. E. Troyan. Mar. 4 Mar. 4 Ling common senses in plant opera- tions. J. E. Troyan. Mar. 4 June 10 June 10 Jan. 7 Long common senses in plant opera- tions. J. E. Troyan. Mar. 4 Mar. 4 June 10 Jan. 7 Jan. 10 Jan. 10 Jan. 10 Jan. 10 Jan	238 238 1158 1178 1178 118 240 132 98 112 122 116 116 108	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 83 *188 *34 47 58 34 90 168 52 84 *58 93	fiber producers with plant in Ala. (C)	32 31 *210 63 *9: 114 62 44 *116 31 96 50 70 77 72 42 104
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Grandkar geressure extractor. July 8 Steam tracing inplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation	238 238 1158 1178 1178 118 240 132 98 112 1236 112 116 108 108	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 52 84 *58 93	fiber producers with plant is Ala. (C) Sept. 2 Powder, calied Alkanex, for insulating electrical apparatus (C) Sept. 30 Tanks of filament-wound reinforced polyester built in place Mar. 13 Terephthalic acid route to polyester fibers gets Japanese plant (C) Polyethylene Adhesive—resin yields bond to polyethylene July 22 Cable cover—westherproof Dec. 8 Chlorinated polyethylene adds impact strength to PVC June 24 Extruded film from Holland makes storage basin watertight (N) Film protects fume vent from weather. E. J. Erwood (P.N.) Sept. 30 ICl plans low-density plant near Sasolburg, South Africa (C) Mar. 4 Jacketing for underground cables Linear polyethylene gets 20% price cut (C) Packing fiber resembles cotton batting Pipe of modified polyethylene called Cab-XL (C) Aug. 5 Packing fiber resembles cotton batting Pipe of modified polyethylene called Cab-XL (C) Aug. 19 Polyethylene oxide resins Nov. 25 Powdered polyethylene boosted by rotational molding (N) Dec. 22 Resin for injection molding Aug. 19 Polyisoprene—Catalysts promise cheaper polyisoprene—Catalysts promise cheaper polyisoprene—Catalysts promise cheaper directly on surface (C) July 8 "Glow-discharge polymerization" puts organic film on metals (chart) (C) Sept. Sept.	32 31 *210 63 *9: 1114 62 44 416 31 96 50 77 72 42 104
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Gasoka ge pressure extractor. July 8 Steam tracing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation	238 238 1158 1178 1178 118 240 132 98 112 122 116 116 108	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 \$3 *188 *34 47 58 34 90 168 *106 206 52 84 *58 92 *92 88	fiber producers with plant is Ala. (C) Sept. 2 Powder, calied Alkanex, for insulating electrical apparatus (C) Sept. 30 Tanks of filament-wound reinforced polyester built in place Mar. 13 Terephthalic acid route to polyester fibers gets Japanese plant (C) Polyethylene Adhesive—resin yields bond to polyester of the plant (C) Polyethylene Adhesive—resin yields bond to polyester of the plant (C) Cover—westherproof Dec. 8 Chlorinated polyethylene adds impact strength to PVC June 24 Extruded film from Holland makes storage basin watertight (N) Film protects fume vent from weather. E. J. Erwood (P.N.) Sept. 30 ICI plans low-density plant near Sasolburg, South Africa (C) Mar. 4 Jacketing for underground cables Linear polyethylene gets 20% price cut (C) Packing fiber resembles cotton batting Pipe of modified polyethylene Aug. 19 Polyethylene oxide resins Nov. 25 Powdered polyethylene boosted by rotational molding (N) Dec. 28 Resin for injection molding Aug. 19 Polyisoprene—Catalysts promise cheaper polysoprene—Catalysts promise cheaper polysoprene—Catalysts promise cheaper give chicked the polymerization Encapaulating process forms polymer directly on surface (C) July 8 "Glow-discharge polymerization" puts organic film on metals (chart) (C) Sept. 2 Polymers "Glass resins" new inorganic polymers."	32 31 *210 63 *9; 114 62 44 *116 31 96 50 77 77 72 42 104 90
metering costs Silica concentration gives cooling- water blowdown rate. J. S. Beecher (chart) Simple method determines brine con- centrations, Susan Weiner. June 10 Single-stage pressure extractor. July 8 Steam tracing unplugs air-transport system. G. E. Monroe Apr. 15 Strap-on studs eliminate welding in tank insulation May 13 System protects heat-sensitive chem- ical in pipeline Saphier & Butcher Sept. 2 Test your CEQ. Robert Lemilch Jan. 21-136, Feb. 18-178, Mar. 18- 202, Apr. 15-180, May 13-198, June Thermal resistance of pipes and tub- ing. David Stuhibarg (table). Nov. 25 Toward more accurate tank-level gag- ing. Coe & Scarbel Dec. 23 Tucson dentist performs Titanic ex- traction Nov. 25 Use expansion coefficients for density calculations. S. H. Fishtine. Sept. 2 Variable A. V. A. Variable A. V. A	238 238 1158 1178 1178 118 240 132 98 112 1236 112 116 108 108	W. H. Hibbard, Jr. (charts & tables) Concrete-like plastic developed at Royal Dutch Shell (C)	*203 84 *235 83 *188 *34 47 58 34 90 168 *106 52 84 *58 93 *92 88	fiber producers with plant is Ala. (C) Sept. 2 Powder, calied Alkanex, for insulating electrical apparatus (C) Sept. 30 Tanks of filament-wound reinforced polyester built in place Mar. 13 Terephthalic acid route to polyester fibers gets Japanese plant (C) Polyethylene Adhesive—resin yields bond to polyethylene July 22 Cable cover—westherproof Dec. 8 Chlorinated polyethylene adds impact strength to PVC June 24 Extruded film from Holland makes storage basin watertight (N) Film protects fume vent from weather. E. J. Erwood (P.N.) Sept. 30 ICl plans low-density plant near Sasolburg, South Africa (C) Mar. 4 Jacketing for underground cables Linear polyethylene gets 20% price cut (C) Packing fiber resembles cotton batting Pipe of modified polyethylene called Cab-XL (C) Aug. 5 Packing fiber resembles cotton batting Pipe of modified polyethylene called Cab-XL (C) Aug. 19 Polyethylene oxide resins Nov. 25 Powdered polyethylene boosted by rotational molding (N) Dec. 22 Resin for injection molding Aug. 19 Polyisoprene—Catalysts promise cheaper polyisoprene—Catalysts promise cheaper polyisoprene—Catalysts promise cheaper directly on surface (C) July 8 "Glow-discharge polymerization" puts organic film on metals (chart) (C) Sept. Sept.	32 31 *210 63 *9; 114 62 44 *116 31 96 50 77 72 104 90 65

Mineral oils aid polymer workability in Montecatini process (C). Mar.	38	Economic evaluation of R&D projects. A. J. Weinberger (charts)		Wastes from pulp mill go 1,700 feet un- derground (N)	52
Propylene-ethylene copolymer, called Olemer, from Avisun (C)June 10		Improving R&D's batting average Oct. 28	8 123	Pumps Buying chemical pumps, T. E. John-	
July	9.0	How to estimate required invest-		son	138
Propylene-ethylene copolymer, called Propathene, from ICI (C)May 2: Urethane polymerSept. 16	60	ment	81	problems. J. H. DoolinJan. 7 Centrifugal pumps and rotative speed.	•103
A-ray procedure can probe polymer		Pricing new products. L. Seglin	1 181	E. J. Serven (charts) Apr. 1	81
structure (N)Apr. 28 Polypropylene		Pricing new products. L. Seglin (cnarts)	8 100	E. J. Serven (charts) Apr. 1 How to select centrifugal purates—re- port. H. M. Pollak (charts & tables)	***
Adhesive—taffylike elastomer for hot- melt adhesives	52	versification activity (N)Feb. 18 Why profitability estimates go wrong —CE Cost File (tables)Oct. 28	5 100	Feb. 4 Packings—selections and maintenance.	
melt adhesivesJan. 7 Avisun strengthens bid for pipe mar- kets (C) Feb.	34	-CE Cost File (tables)Oct. 28 Professional Development	8 154	J. J. Whalen (tables)Nov. 11 Testing facility at Allis-Chalmers gives	
Du Pont and Montecatini to share	33	Encounaging engineers to write P F	•150	pump buyer more data (N).June 24 Purchasing	*46
polypropylene patents (C)June 24 Dyeable fiber from U. S. Rubber (C) June 24-40, July 8		Siegfried July 8 Ethics—How useful are our engineer- ing codes?—CE invites readers		Equipment specification guides. N. H. Parker (charts)	
Dyeable polypropylene fiber from Union		views (N)	0.4	Mixers	*107
Carbide	*104	(text)	6	EvaporatorsJuly 22	*135
Fiber makers ride off in all directions, Frances Arne (N)Nov. 25	*52	Engineers speak out—CE reports on replies	177	Selecting the best vendorAug. 19 Purification	
Frances Arne (N) Nov. 25 Injection molding resin Feb. 18 New resin combines toughness and rigidity Mar. 4 Propylene-ethylene resin called Olemer	108			Acetone-based process removes carbon dioxide from gases (N)July 8 Diethanolamine—fouled DEA solution	86
Propylene ethylene resin called Olemer	58	Gordon	*179	Diethanolamine—fouled DEA solution comes clean at Tidewater oil refin-	
Polystyrene July 8	90	How to find that better job. D. E.	166	comes clean at Tidewater oil refin- ery (chart) (N) Esse's adsorption process for purifying	40
Flame-resistant polystyrene Apr. 29	74	KaldenbergDec. 9 Life sciences engineering—new field for	190	Esso's adsorption process for purifying gases wins CE achievement honors Nov. 11	0000
Foamed polystyrene core for solid rocket (N) May 27	*72	the chemical engineer. A. G. Freder-		Hydrogen purification route found as	-230
High-impact resins May 27	86	ickson (QED) Aug. 5 Marks of a profession. Gen. B. A. Schriever (QED) July 8 Men behind the rockets. W. P. Killian	155	outgrowth of fuel-cell research (C) Sept. 16	69
Japanese machinery planned for Se- kisui's U. S. plant (C)Feb. 18 Polyurethane	84	Schriever (QED)July 8 Men behind the rockets. W. P. Killian	195	Sulfinol process for purification of sour gases (table) (N)Sept. 16 Pyrazine—Derivatives being tested as	•78
Casting resin	48	(QED) Aug. 5 New level of perfection, John Gammell (QED) Mar. 18 Nursing the big birds—Ch.E.'s in the Titan launch crew and other rocket operations. R. L. Sackheim Mar. 4 Obsolvence—Industry urns teacher	157	Pyrazine—Derivatives being tested as jubricants, hydraulic fluids for high-	
Corfam—Du Pont's synthetic leather wins CE achievement honors. Nov. 11	*235	mell (QED)	237	speed aircraft (C) Sept. 16 Pyrrhotites—Copper-removal process ups	74
Foams see under Foams Markets for urethane paints and seal- ants pick up speed (N)Oct. 14		Titan launch crew and other rocket	****	value of iron ore (N) Nov. 25 Quality Control—Oil samples take speedy	60
ants pick up speed (N)Oct. 14 Sprayable urethane covering is both	96	Obsolescence—Industry turns teacher to check technical obsolescence	*119	ride to laboratory (N)May 13	*92
protective and decorativeAug. 5 Urethane liquid yields abrasion-resist-	*70	to check technical obsolescence Attacking technical obsolescence.		D.	
ant elastomer Sept. 16 Urethane rubber Apr. 29	96 74	Attacking technical obsolescence. M. W. KriegelApr. 29 Training engineering technicians.	134	R	
Polyvinyl Acetate		Training engineering technicians. G. L. BeiswingerMay 13 Teaching engineers about computers.	•191	Radiation Dow's use of gamma radiation in the	
Coating protects against scratches June 24	*64	J. P. Laird	*140	production of ethyl bromide wins CE achievement honors (chart). Nov. 11	234
Latex—resin latexes outpacing rubber (tables) (N)June 10	*96	Running an in-plant course, P. J. Brennan June 24 Obsolescence—MIT's new program to help engineers combat obsolescence	121	Gamma radiation wins role in Ruma-	
(tables) (N)	62	Obsolescence—MIT's new program to help engineers combat obsolescence		nian paraffin oxidation process (C) Feb. 18	77
Potash	-	(C)	81	Industrial applications explored at world conference (C)June 24 Irradiation aims at chemical-process	38
Brine—American Metals Climax may recover potash from hot natural		subject of conference (C)Apr. 15 Obstacles to job progress. F. A. Hol-	79	irradiation aims at chemical-process outlets—world conference at Salz- burg, Austria (N)Aug. 19	
brine (C)June 24 IMC's new process at new Carlsbad,	35	land Oct. 28 Professional workers likely to be un-	144	burg, Austria (N)Aug. 19 Radioactivity	*86
N M plant ungrades mixed area	81			Nuclear-waste woes eased by calcining	*26
(C)		Ready to do engineering in the 21st century?	254	techniques (charts) (N)Apr. 1 Pipe cleanout eased by radioactive	-26
	82	Should engineering be like show business?Jan. 7	102	tracers (N)Sept. 2 Radioisotopes	48
venture (C) Feb. 18 Route to Canada's underground pot- ash? (C) Nov. 11 Potassium iodide for disinfecting swim-	122	Ten common weaknesses in engineering	*210	Euratom's commercial uses for radio.	66
Potassium lodide for disinfecting swim- ming pools	36	What is your chance for promotion? Conrad Berenson	*108	isotopes program (N)Apr. 29 Sulfuric acid plant in Poland uses radioisotopes for process control (N)	0.0
may make metaphosphate market-		What managers look for in engineer- ing reports (table)Mar. 18	9100	Sept. 30	5.4
able (N)	*62	Profitability see Economies	-140	Rare Earths Adding rare earths to copper improves	
Giant press converts metal powders		Project Engineering Bids—Struthers adopts policy of	*	oxidation resistance (C)Nov. 11 Praseodymium—key to new solid-state	117
into billets (N)	°78	charging clients for preparing bids	17	Raw Materials	120
lurgy produced from low-grade ores in Canada (C)Apr. 29-47, (C)		(C)		Paw materials: will It & have enough	88
May 13	83	tozzi & Lipinski (charts & tables) Feb. 18	*195	in 2,000? (tables)	
Metal powders score big gains in 1962— end-uses, markets (N) May 27 Nickel powders in spherical shape	68	Managing engineering projects report		Interior, J. M. Kelly (QED), June 10 Rayon	284
Feb. 4	60	J. M. McLellan	-157	British producer uses fluidized bed to recover carbon disulfide (C). Mar. 4	31
Superfine metal and oxide powders en- hance metals' properties (C).Aug. 19	84	town gas (C)	43	Why rayon maker recovers CS ₂ (chart) (N)	92
Tungsten granules via fluidized-bed fluoride process (C)Oct. 28	72	Propylene Outlook—petrochemical market tempo		Fiber makers ride off in all directions. Frances Arne (N)Nov. 25	*52
ressure Design of vesse's under external pres-		may pick up after 1965 (chart) (N) May 13	9.4	Reactions	02
sure, H. W. Hamm (charts) (P.N.) Sept. 30	114	Propylene feedstock ousts acetylene at	84	Finding order of chemical reactions. Ferdinand Rodriguez. (charts &	
Pressure filtration systems—clearing	774	Goodrich (C)Aug. 19 Soviet process uses split-second con-	0.4	tables)	159
up some misconceptions. C. A. Jahreis (charts)	237	tact with preheated butane to up yield (C)June 24	38	Ratcliffe (charts) Sept. 30 °	101
Pressure-relieving systems. Eric Jenett (charts)		Protein Biological process makes protein, vita-		Reactors AEC's Oak Ridge National Laboratory	
Design considerationsJuly 8 ComponentsAug. 19	*125 *151	min supplements from petroleum (C)Jan. 7	21	to shut down (N)	126
How to calculate back pressures in vent lines	*83	Ferredoxin, a protein substance, iden- tified as key agent in green-plant	***	cooled power reactor using thorium as fuel (N)	32
Safety in high-pressure research, E. L.		energy conversion (C) May 13 Public Relations—Business must be lik-	85	Chemonuclear reactor under design (C)	
Clark	100	able. A. J. Schroeder (QED). Sept. 16	234	EBOR (experimental beryllium oxide reactor) to be built for AEC (C)	86
Pressure-drop in long viscous-fluid pipelines. K. Lothholz W. (charts)		Pulp and Paper Analog control system for Kamyr's		July 8	68
Jan. 7	*89	continuous digester (C) Apr 15	79	Equation quickly scales reactor variables. Bernard Kouzel (P.N.). Feb. 18	180
Pressure drop of air in activated car- bon beds. H. B. Allport (P.N.)		Chlorine dioxide route from Olin is similar to Hooker's (C)Sept. 16	74	Organic coolants — technology moves ahead (C)	54
(chart)	132	Plants—semiannual inventory of new plants and facilities Apr. 15-170,		Organic reactors lose stature with AEC	52
rices—How to price new products. L. Seglin (charts)	181	Production outlook bright for western	135	(N)Feb. 4 Scale-up of chemical reactors from	34
rocesses	10	states (N)	44	pilot to production size. F. A. Hol- land (charts & tables)Apr. 15 ° Tables simplify analysis of non-iso-	145
Analog model for large chemical proc- esses. W. F. HillyardApr. 29			100	Tables simplify analysis of non-iso-	
The state of the s	*118	Pulp plant to get closed-loop computer	138	thermal reactors R M Fabuss &	
Inventory—14th inventory of new processes and technologyJan. 21	*118 107	Pulp plant to get closed-loop computer	*90	thermal reactors R M Fabuss &	153
Inventory—14th inventory of new processes and technologyJan. 21 Inventory—15th inventory of new	107	trip (N)		thermal reactors. B. M. Fabuss & others (tables)	
Inventory—14th inventory of new processes and technologyJan. 21 Inventory—15th inventory of new processes and technologyAug. 5 roduct Development		trip (N)	•90	thermal reactors. B. M. Fabuss & others (tables) Apr. 15 Tubular reactor design simplified with chart. R. C. Schwing (P.N.) Aug. 5 Refining Allied's planned refinery in Costa Rica	153 130
Inventory—14th inventory of new processes and technologyJan. 21 Inventory—15th inventory of new processes and technologyAug. 5 coduct Development Advertising as an aid to new product development. R. W. Wilkerson	107	trip (N)	*90 112	thermal reactors. B. M. Fabuss & others (tables)	153

E

Ref

Ci

A

Di Di Ec

Ex

Fu Fu Fu Goi Ho

Irra of Jappe to Knn w Linn m Linn b Maar Jin Mooo Did m Petr Plass pr Plass for CQ Radd ex

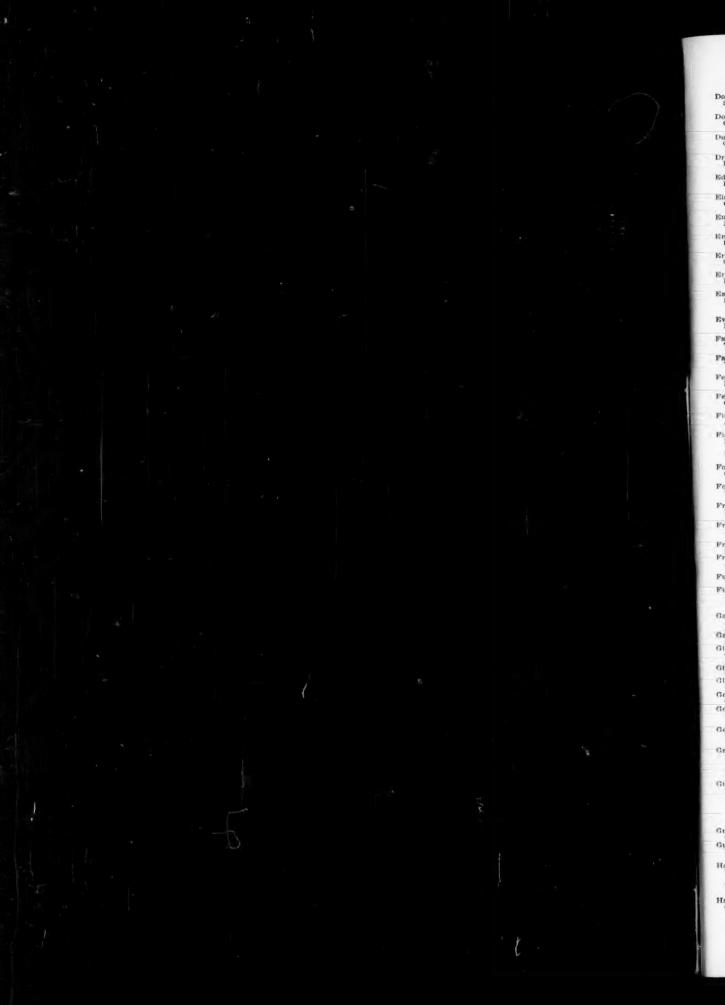
				· ·		
Copper-refining process uses ammonia		The relation of market research to product and market development.		Chemical-mechanical process packs solid rockets' punch at Thiokol—		
to improve scavenging of oxygen (C) Aug. 5	48	N. B. Sommer (QED)Feb. 18	208	flowsheet. Eugene GuccioneMar. 18 Dentist performs Titanic extraction	*156	
Cracking process for ethylene from	57	"Research factory"—new step between lab and pilot plant (N)July 22	82	(P.N.)	*134	
France (C)		Research retrieval recommended as di-		Fluorine woodd by aerospace tests (N) Nov. 11	138	
solution comes clean at Tidewater Oil (chart) (N)Mar. 4 Distillates-cleanup technique called	40	versification activity (N)Feb. 18 The sea—Scouring the sea for its cache		Men behind the rockets. W. P. Killian		
Distillates-cleanup technique called		of chemicals (N)May 27	*66	(QED)Aug. 5 Nuclear-thermionic unit aims at aero-	157	
Hooverfining (formerly called Nal- fining) (C)Oct. 14 Oil refineries—survey spotlights U.S	88	Solid-propellant goal achieved in re- cent test (N)Feb. 18	*100	space outlet (N)	42	
Oil refineries—survey spotlights U.S.	38	Space effort has some industrial value		Titan launch crew and other rocket		
giants (table) (N)Sept. 2 Oil refinery uses MEA to remove H ₂ S		Denver study finds (C)July 22 Space research: a free ride for chemical		operations, R. L. SackheimMar. 4 Plastic core for solid rocket (N)	*115	
Oil refining adds three more computers	40	industry? (N)	100	May 27	*72	
(N)	*100		92	Plastic-lined rocket runs "cool" (C) Jan. 21	48	
Petroleum technology gets multi-process boost at world congress (N)July 8	*72	Synthetic rubber subject to four projects (N)	100	Re-entry glider may be made of rub- ber-coated metal "cloth"—FIRST		
Swedish process for refining edible oils (C)May 13		ects (N)	173	project (C)	115	
To run a tant oil refinery, keep track of		(QED)	40	Superconducting magnet systems may	60	
hydrogen (table) (N)Dec. 9 Unicracking-JHC process—new cataly-	94	Vacuum poses tough hurdle for space lubes (chart) (N)May 27	*74	shield future spacecraft (N)Aug. 5	00	
tie hydrocracking method (C)		Where ideas come from (QED). Mar. 18		Acrylonitrile rubber cailed Chemigum		
Refractory Materials May 27	55	Resins Acetal resins called Polyfyde may be		Mar. 18 Additive acts as anti-ozonant and	108	
Allis-Chalmers' new refractory mate-	108	made by Goodrich (C)Aug. 5 Acrylic resin—one-component polymer	43	cracking inhibitor Sept. 16 Ameripol CB—Goodrich-Gulf's new gen-	98	
Boron nitride produced by conventional	108	system	7.4	eral-purpose cis-polybutadiene rubber		
synthesis at Carborundum—nowsneet.	110	Aluminum-filled epoxies for high-temp foundry forms	106	(C) Jan. 7 26, (N)Jan. 21 Ameripol CB—Goodrich-Gulf's old SBR	70	
J. W. GilpinOct. 28 Coatings—refractory coatings. S. W. Bradstreet (table)Dec. 23	110	Butadiene resins	142	line stretched to make stereo rubber		
Bradstreet (table)Dec. 23 Direct path from refractory oxides to	77	Casting resin	48	line stretched to make stereo rubber—flowsheet. F. C. PriceJan. 21 C4 petrochemicals ride on synthetic	*84	
carbides (chart) (N)Nov. 11 Electrocladding of refractory metals	134	lon's wear resistanceJan. 7	*50	rubber (table) (N)Apr. 1 Catalyzed elastomer coating fights cor-	3.0	
(C)Oct. 28	74	Encapsulation resin Jan. 21 Epoxy casting resin Jan. 21	70	rosionJan. 7	*48	
Fluidized-bed coating process to pro-	40			Cis-polybutadiene rubber available in oil-extended forms (C)July 22	71	
tect refractory metals (C)June 24 High-temperature metals. Ross & Mc-		mixed with Teffon	114	Coal fines may find outlet in rubber		
Henry (charts & table)Nov. 25	*97	tic properties (C) Aug. 5 45, (chart) Aug. 19	*106	Goods (N)	44	
Refrigeration Comparing refrigeration systems. E. K.		Ion-exchange resin called Dowex 4	108	asphalt	84	
Tanzer (charts & tables)		Apr. 15 Ion-exchange resins—Ion exchange re-		Dunlop Rubber and Montecatini Will exchange licenses and patents on		
Pros and cons of machines, refriger- ants; analyzing a reciprocating		port. A. W. Michalson (table). Mar. 18	*166	exchange licenses and patents on elastomeric polymers (C)Feb. 18	84	
Analyzing centrifugal and absorption	*215	Ion-exchange resins—a look at Ionac's synthesis — flowsheet. Eugene Guc-		modified polystyrene Nov. 25	70	
systemsJune 24	*105	cione	*138	EPR-Montecatini uses cyclo-octadiene		
Cryogenic refrigerator developed at	52	trends-markets, producers (tables)		as component, produces sulfur-curable terpolymer (C)May 27	60	
G-E (N)		Resin outpacing rubber in latex growth (N)June 10	*96	Ethylene propylene terpolymer—Dunlop Canada may get basic U.S. patent		
quires no preliminary cooling (C) Sept. 16	74	growth (N)June 10 Rubber latexes—new products enter old markets (N)June 24	*48	(U)	29	
Research		Melamine-formaldehyde sales recover		Fluid, poured-in-place rubber gasket May 13	*110	
Acoustic energy: versatile research tool (N)	96	after dip (chart) (N)Nov. 11 Petroleum resinsMay 27	128 86	Latex markets and technology: new		
(N) Agricultural product utilization re- search at Iowa State University. L. K. Arnold (QED) Apr. 15 Coal-research funds up aim at pine-		Phenolic molding resins will compete with metals (C)June 24		trends—markets, producers (tables) Resin outpacing rubber in latex		
L. K. Arnold (QED)Apr. 15	218	Plants—semiannual inventory of new	33	Rubber latexes—new products enter	*96	
Coal-research funds up, aim at pipe- line gas, gasoline (C)Aug. 19	82	plants and facilities Apr. 15 169,	124	old markets (N)June 24	*48	
Dispersion strengthening of metals to get NASA research (N)Aug. 19		Oct. 28 Polyester resin called Paraplex.Apr. 29	134 76	Molecular-weight control—key to U.S. Industrial's easy-to-process alfin rub-		
Dow and Weverhaeuser joint research	96	Polyethylene oxide resinsNov. 25 Polyethylene resin for injection mold-	72	bers (C)	22	
venture (C)	79	ing	104	plants and facilities Apr. 15 170,		
A. J. Weinberger (charts & tables)		Propylene-ethylene resin called Olemer July 8	90	Polybutadiene elastomer for use in	135	
Improving R & D's batting average Oct. 28	123	Resin extender called IsoflexDec. 9	114	polystyrenes	110	
How to estimate required invest-		Soviet process converts coal into phenol- like resin (C)July 22	76	Polyisoprene rubber called Natsyn Dec. 9	112	
ment	113	Technology-14th inventory of processes	111	Resin curing of ethylene-propylene ter-	26	
Exotic new products may be tomor-	81	and technologyJan. 21 Tetra-Flex—flexible phenolic resins (C)		polymers (C) Dec. 23 Self-curing latex Sept. 16	100	
row's commercial chemicals (C)		Mar. 4 33, Apr. 15 THPC resin systems for fireproofing	108	Shell and Polymer Corp. join forces to	24	
Forecast of CPI funds for R & D to	53	fabrics now on sale (C)July 22	74	win British market (C)Apr. 1 Silicone rubberNov. 25 72, Dec. 23	50	
1966 (table) (N)July 8 Fuel-cells command intense develop-	76	Thermoformed and blow-molded resins rising fast—market forecast (tables)		Silicone-rubber molding compound Feb. 4	*56	
ment effort (C) June 10 83, (N)		(N) Sept. 30 Thiokol secures license to Japan's	43	Synthetic rubber subject of four re-	100	
Fuel cells for spacecraft: new ap-	54	fluorocarbon Polyflon resins (C)		search projects (N)Mar. 18 Technology — 14th inventory of proc-		
proaches under study (C) Sept. 30	33	Vinyl resins	144	esses and technologyJan. 21 Technology — 15th inventory of new	111	
Fuel cell ready for maiden spaceflight (N)Oct. 14	*104	Rhenium-Novel recovery puts rhenium		processes and technology Aug. 5	110	
Gordon Research Conferences sets 1963	102	within industry reach — flowsheet. W. H. DavenportJune 24	*86	Urethane rubber	14	
How we can meet industrial research	102	Rocket Propellants		CPI goals for 1963 (N) Apr. 1	28	
needs-guest editorial. C. C. Furnas	*113	Air Force contracts open way to giant solid-fuel rockets (C)May 13	86	Coal converted to phenol-like resin via new process (C)July 22	76	
Irradiation aims at chemical-process		Beryllium used as high-energy ingredi- ent in Atlantic Research propellants		Concrete that replaces cement with	100	
Japanese to research making nylon by	*86	(C)June 10	81	polyester resins (C)Nov. 11 How the Soviet CPI shaped up in 1962	120	
telomerization (C)Feb. 18 Know when to stop. C. H. Greene-	84 -	(C)June 10 Chemical-mechanical process packs solid rockets' punch—flowsheet. Eu-		(table) (N)	89	
walt (QED)Dec. 9	229	gene Guccione	*156	tica (N)Jan. 21	52	
Lime research project to help steel-	82	Computer aids testing of solid pro- pellants (N)	100	Look for big doings in Soviet Union's CPI (N) Dec. 9	102	
makers (N)		Continuous process at Aerojet produces mightier solid propellant (C)Mar. 4	31			
by Samuel Lenher (QED)Feb. 4 Marketing R&D wanted, W. 8. Penn,	144	Cryogenic washing scrubs hydrogen for	0.1	S		
Jr. (QED) Sept. 2	146	rockets—flowsheet. Eugene Guccione May 13	*150	Safety		
Moon's chemical composition being probed (N)Jan. 7	38	Ethylene oxide debugs rocket motors		Dead man, who loved you? (QED) Sept. 2	144	
The need for research priorities, L. K.	910	(N)Apr. 15 Fuel cells—new solid-electrolyte cells	96	Determining toxicity of new materials.		
Wheelock (QED) Feb. 18 Nitrogen compounds research in Britain	210	for aerospace (N)Nov. 11 Fuel cell ready for maiden spaceflight	*125	R. C. Wands (QED)Sept. 16 Explosions and fires of 1962 prod 1963	229	
suggests new metals-separation meth- ods (C)June 24	38	(N)	*104	safety push. Herbert Popper	*91	
Old projects research to aid decision-		Fuel cells for spacecraft—new approaches under study (C) Sept 26	33	Jan. 7 The fire menace—how to cope with it.		
makers (N)	196	proaches under study (C)Sept. 30 Polaris gets improved fuel from new		The fire menace—how to cope with it. H. E. Webb, JrDec. 9 Nuclear safety test, called LOFT, to	196	
July 22	88	Guccione	*62	focus on coolant circuit (N) Dec. 23	42	
Plastics deterioration to get long-term probe (N)Sept. 16	82	"Slush" hydrogen proposed for space	25	Pressure-relieving systems. Eric Je- nett (charts)		
Plastic models sub for metals in stress		fuel (C)		Design considerations July 8	•125	
The puzzle of creativity. J. W. Gardner	*64	biggest blast yet (N)Sept. 16 Solid-propellant goal achieved in re-	*92	Components Aug. 19 How to calculate back pressures in	*151	
(QED)Jan. 21	196	cent test (N)	*100	vent linesSept. 2	*83	
Radiation for industrial applications explored at world conference (C)		Air Force contracts open way to giant		Radioactivity—safeguarding populated areas against reactor accidents		
June 24	38	solid-fuel rockets (C)May 13	86	(QED) Dec. 9	231	

Safety in high-pressure research. F. l Clark Mar The unsafe-acts inspection. R. 2 Stapleton Aug.	V. 183	cut to 15 minutes (N)July 22	3 3 4	Pt 11 How to apply statistics i design of experimentsAug. Pt 12 Factorial design of experi- mentsSept.	5 113 - 2 *99
Salaries The base is raised (tables)Dec. 2	3 94	Unequal marine shipping rates hur U. S. exports (N)Jan. 2	38	Steam—Superheated steam produced i boiling-water power reactor (C)	
Engineering scales show healthy gain	18	Aluminum-coated silica fibers com- pacted into solid cores by Britain's		Steel Nov. 1	
(C)	S 7 99	Rolls-Royce (C)	88	Carbon-steel pipe with improved properties (C)Oct. 1	4 83
		Pigment	144	Carbon-steel tubes for low-temperatur service, R. C. Angell (chart May 1	e)
(chart) (C)	7	Silicon		Cast stainless alloys resist hot sulfur	-
		Masonry waterproofing agent teams boron and siliconJan. 7 Organo-silicon compounds to get Stauf-	50	bearing gases. R. V. Hughson (table)June 2	4 -138
It pays to be your own boss—NSP survey (chart) (C)Aug. New York P.E.'s propose minimum	5 50 s	fer plant at Adrian, Mich. (C)	85	Coating carbon steel with stainless type steel—new Du Pont process (C)
Older engineers take it on the chir	19 80	Semiconductor crystals from Texas Instruments have optimum proper- ties (C)June 24		Continuous casting boosts billet yield	d
R. A. Labine (charts & table Apr. 1	5 173	ties (C)	40	at Roanoke (N)June 2. Continuous casting processes, basic	c
Professionals tend to be dissaustied survey saysNov. 1 Seattle engineers study feasibility o	1 254	Silicon Dioxide—Separating glass sand from clay—flowsheet. C. R. Hav- ighorstJune 10	•158	oxygen furnaces spark modernisa tion (C)Apr. 1	5 84
individual employment contracts (C)	Silleones		Corrosion test for stainless is new fast	
Top CPI executives' pay, starting pay		Coating protects chrome Aug. 19 Rubber—silicone rubber Nov. 25-72, Dec. 23	50	stahl-Heraeus vacuum process avail-	-
	5 *118	Silicone-rubber molding compound Feb. 4	*56	able in U.S. (C)	13
What is an engineer worth? Herber HubbenApr.	1 *96	Transparent potting compound cures without heating Sept. 30		Pont for cladding steel plate (C) June 10-88, (C) Oct. 2: Layering—new method for making multiwall vessels (C)June 2:	8 67
Acia salt activates metal surface		Silver Nitrate—High-purity silver ni- trate from Engelhard plant—flow-		multiwall vessels (C)June 26 Linde's expanded oxygen unit will be	85
prior to electroplating Sept. 3. Brine's salt content found by simple	62	Simulation		steel's largest supplier (C)Sept. 1 Linz-Donawitz process keeps winning	2 27
method. Susan weiner (r.N.	238	Analog computers' basic roles in the CPI—report. J. C. Phillips & others		many converts (N)	1 126
Heat transfer salts. Voznick & Uh (charts & tables)May 2' Salvage — Chlorine tank salvage — who	*129	CPI—report, J. C. Phillips & others (charts & tables)Apr. 29 Computer simulation of chemical proc-	*99	Nickel-plated steel protects product purity. R. V. Hughson (table) Apr. 15	•190
pays costs? (C)Feb.	36	esses gets boost at computing cen- ter (N)Feb. 4 Society of Engineering Science—New	•42	Nitrogen makes steel stronger in Ger- many's Mannesmann process (C)	
Activation analysis matures as indus-	*92	Society of Engineering Science—New engineering society bows (N) Dec. 9	106	Mar. 4 Oxygen steelmaking — capacity boost,	38
trial tool (chart) (N)Dec. (Device yields true sample from varying gas flow. W. H. Gries (P.N.)		engineering society bows (N) Dec. 9 Society of the Plastics Industry, Inc. —Outlook for plastics by 1970 (N)		lining protection make news (C) Oct. 14	
Aug. 1 Gas impingers find dust load of water-	*132	Soda Ash	92	Rotating oxygen converter from South Africa may improve Linz-Donawitz	
saturated gas, D. R. Ericson (P.N.) Sept. 36		Soda Ash — Highly absorbent form, called Flozan, for use in cleansers.		method (C)June 24 Shaft—novel composite shaftAug. 5	*142
Oil samples take speedy ride to labora-		Sodium borohydride solution aids vat	70	Texas firm will build nation's most ad- vanced integrated steel plant (C)	
tory (N)	*200	dyeing of cotton	58	UOP will license Madaras process un-	88
Scheduling Critical path—Plain talk on critical		er ingredient called FlozanAug. 5 Solar Power—Ion Physics produces elec-	70	Why the furor about high-strength	28
path method. R. L. Martino (charts)	221	tricity by using solar cells made with an ion-implantation process (C)		Sterilization—Ethylene oxide can debug	230
Managing engineering projects—report. J. M. McLellanMay 13	•157	Solids-Pipelines for transporting solids.	22	rocket motors (N)Apr. 15 Steroids—Completely synthetic stereoids	
Technique offers new approach. Mat-		Condolios & Chapus (charts) June 24 *93, July 8 *131, July 22	*145	produced by Wyeth (C) Sept. 16 Storage	
tozzi & Lipinski (charts & tables) Feb. 18	•135	Solvents used in commercial liquid-		Frozen-earth storage sot for natural gas (N)	28
Vacations—Who will fill the vacation void? W. H. RichardsonMay 27 Why Charlie can't leave at closing	•146	liquid extractions—Liquid extraction report. Oberg & Jones (table)	124	Liquid gas storage tanks are giant aluminum spheresApr. 1	*116
time. William RuchtiNov. 11	*250	Sulfolane, solvent for extracting aro-	124	Plastic bottom makes storage basin watertight (N)	44
Collier Carbon & Chemical trying to		matics, now also purifies sour gases (chart & table) (N)	*78	mixtures (N)	
cancel contract with U.S. to recover phosphorite nodules (C)Apr. 29	5.4	search tool (N)May 13	96	Styrene-butadlene Latex coating for paperJune 10	110
Manganese nodules next on U. S. sched- ule? (C) Apr. 29-52, (N). May 27 Scouring the sea for its cache of chem-	66	Space Technology Coatings for aerospace metals get		Latex markets and technology: new trends (tables) (N)June 10	•96
icals—ACS symposium (N)May 27	*66	Coatings for aerospace metals get once-over (N)	70	(N)June 24	*48
Caustic seal protects pumps in acid gas service. Dan Luss (P.N.)		Feb. 18	209	Continuous sugar-cane diffuser scaled up from pilot unit (C)July 8	70
Sept. 2 Teflon tape eases pipe-fitting prob-	118	Lubricant system from Westinghouse (N)June 24 Moon's chemical composition—subject	56	Sugar-alumina shipping pact's first sugar delivery (N)July 8	*86
lems	52	of two research programs (N) Jan. 7	38	Automatic system recovers sulfur from	
(N)Oct. 14 Separation	96	Space effort has some industrial value, Denver study finds (C)July 22 Space research and the chemical in-	76	lean acid gas at Sinclair Oil (chart) (N)	*38
Methane—Air Products cryogenic proc- ess for making synthetic methane		Space research and the chemical in- dustry—ACS topic (N) May 13	100	Canada soars to new status in world sulfur (table) (N)Mar. 18	102
(C)Apr. 1 Permeation technique from Linde has	19	Vacuum poses tough hurdle for space	•74	sulfur (table) (N)	*138
	88	Specifications - Equipment specification		(N) Sulfuric Acid	102
Removing oil and grease from water. C. A. Lee (chart) (P.N.). Feb. 18	176	N. H. Parkei. See Equipment Spraying method for froth spraying of urethane foam (C)May 27	62	Bayer process extra absorption step enhances yield (C)June 10	88
ification (C)May 13 Removing oil and grease from water. C. A. Lee (chart) (P.N.)Feb. 18 Settling fine suspensions fast — new method from Canada (N)Feb. 18	94	nationalized by inclusion of metric		Catalyst	
Flocculents—groundswell under way in		equivalents (C)	36	Powder form available (C)Jan. 21 Apr. 15 Radioisotopes keep tabs on acid plant's	*106
synthetic coagulants (table) (N) Apr. 15	98	Improved least-square method for cor- relating nonlinear data. Smith &		byproduct clinker (N)Sept. 30	54
Foan fractionation process, called SCAT, gets full-scale test (C)		Tao	193	Surfactants Amine oxide exhibits high solubility	40
Liquid ion-exchange system removes	38	stants. L. E. Marc de Chazal (P.N.)	160	Biodegradable surfactant called DN-	110
detergents from wastes (C) Sept. 2 Reusing municipal waste waters. T. F.	179	Statistics in chemical engineering— CE Refresher. L. B. Andersen	100	Nonionic, low-foaming wetting agent	
Reusing municipal waste waters. T. F. Sullivan (charts & tables). June 10 Zimmerman process (Zimpro) to get fifth U.S. plant (C)Feb. 18	82	Pt 4 Statistical estimation gives		Nonionic, non-foaming surfactant from	108
Shipping Airlift for liquid heliumSept. 30	54	measures of probable error Jan. 21 Pt 5 Tests and estimates on the	117	Du Pont	34
Better transport needed. Fred Warden- burg (QED)	233	statistical meanFeb. 18 Pt 6 Tests and estimates on the	159	sales, end-uses (chart) (N). Apr. 1 Petroleum fuels plagued by surfactants	
Bulk shipping and containers-Mate-		statistical variance Mar. 18 Pt 7 Analysis of variance provides	191	(N)June 10 TSM compounds with unusually low	
rials handling report. Ayers & Rhodes (chart & table)Sept. 16 Cryogenic shipments — specifications	•172	techniques for rapid data reduc-	157	surface tensions (C) Sept. 16	71
(N)	60	Pt 8 Regression analysis correlates relationships between variables		T	
gets Canada study (C)Aug. 19 Liquefied gas—changes sought in ICC	84	May 13 Pt 9 Multiple regression techniques	173	Tanks Cryogenic—giant aluminum spheres	
transportation regulations (C) Apr. 15	86	correlate experimental data June 10	223	store liquid gasesApr. 1 Coating a tank with Teflon TFE enamel	
Nuclear shipping may be economically competitive with new reactor (C)		Pt 10 Nonparametric statistics pro- vide comparisons between distribu-		Filament-wound tanks built in place	
Jan. 7	28	tionsJuly 8	139	by new Justin techniqueMar. 18	-210

Linings—monolithic tank linings W.A. SeveranceJune 1 Quick calibration of horizontal cylin	0 *248	Deferred curing—cotton's pitch for larger wash-and-wear market (C)		Vanadium—Don't swear at vanadium— sell it, ASME paper says (N)Jan. 7 Vanadium oxide—Vitro will make vana-	42
drical tanks. Leonard & Muench	1	Dial-a-dye system aids British textile		dium oxide by alternating vanadium	
(P.N.) Strap-on stude eliminate welding in	184	firms (N)Oct. 14 Fiber makers ride off in all directions	104	and uranium operations at Salt Lake City (C)	19
Tantaium	200	Frances Arne (N)Nov. 25 Filter media—report R. C. French	•52	bollers, J. R. Fair (charts & tables)	
High-vacuum line successfully sputters tantalum onto glass or ceramic sur-	-	(tables)	*177	Pt. 1	*119
faces (N) May 1 Tantalum alloy May 1 Technetium—Exotic today, commercia tomorrow? (C) Apr. 2	3 *98 3 108	Fireproofing THPC compounds now	46	Vinyl CoatingFeb. 4	58
tomorrow? (C)	52	Metal "cloth" may form space glider—	74	Coating resin	*46
Inventory—14th inventory of new proc-		Metal "cloth" may form space glider— project FIRST (C)Nov. 11 Zepel—Du Popt fabric finish resists	115	Foamed plastisol Hungarian plant's bonus product en- hances PVC's prospects (N). Sept. 30 Plasticizer for vinyls	52
esses and technologyJan. 21 Inventory—15th inventory of new proc-	112	Jan. 21-48, Mar. 4	*60	Plasticizer for vinylsJuly 3 PVC paste developed by Britain's ICI	93
esses and technologyAug. Kirkpatrick Award finalists and their achievements (N)July 2: Technology: everybody's business. H.B	105	Thermodynamics-Comparing refrigera- tion systems E. K. Tanzer (charts & tables)June 10 *215. June 24		Producer sets up application safeguards	02
achievements (N)July 2: Technology: everybody's business. H.B	90	& tables)June 10 *215, June 24 Thickeners for tough jobs. King &	*105	(N)Oct. 28 Resins—ethylene vinyl acetate resins	82
Tools in everyday use in underdeveloped	1 101	Thickeners for tough jobs. King & Schepman (QED) May 13 Thiourea—dialkyl thiourea in liquid	232	Vinylidene chloride Honus product at	144
countries on preent design problem		Thorium-AEC's TARGET project aims	60	Hungarian plant enhances PVC's prospects (N)Sept. 30	52
P. F. Drucker (QED) Feb. (VITA uses individual's know-how or International scale (C) Sept. 16	76	power reactor (N)Apr. 1	32	Hungarian plant enhances PVC's prospects (N)	
Teffon		Tin Hot-dip tinning facilitated by new flux		vidual's know-how on international scale (C)	
Ceramic-filled TeffonOct. 14 Coating a tank with TFE resin Sept. 16	*206	North America's first major tin pro-	24	W	
Discoverer at Du Pont tells Teffon story (QED)June	281	Tin plating wins fresh outlet in oil	*30	Washing-Countercurrent washing calcu-	*93
Du Pont may announce plans for new plant at Victoria, Texas (C), Aug. 5	48	(N)Dec. 9	*96	lations, J. E. Colman Mar. 4 Waste Disposal	
Ebolon—largely Teflon resin tops Tef- lon's wear resistanceJan. 7		Corrosion-resistant metals L. W. Gleek- man (charts)	*217	Coke bed to serve as sink for sulfite slop? (N)	82
FEP-Teflon linings for vessels vie with		Titanium markets jump upward (N) Feb. 18	98	well's FINGAL project (N). July 22	*84
glass (C)	*100	Titanium oxide—American Potash shifts projected plant site from Calif. to		well's FINGAL project (N)July 22 Hydrochloric acid gets good word— from sea serpents (N)Oct. 28	*78
Laminates of Teffon and aluminum in		projected plant site from Calif. to Aberdeen, Miss. (C)Sept. 2 Toluene — Benzoic acid from toluene-	30	Nuclear-waste woes eased by calcining techniques (chart) (N)Apr. 1 Oystermen riled by Puget Bound waste	*26
continuous sheets Sept. 30 Lubricant combines MoS ₂ and Teflon Jan. 7	5.0	lytic system (C) Lune 24	35	compromise (C)Jan. 21 Pulp-mill waste liquor converted into	48
Plating process from General Plastics puts thin coating on metal (C)		Toxics—Determining the toxicity of new materials. R. C. Wands (QED)		salt-cake, soda-ash pellets (C) Oct. 14	83
July 22 Tape speeds piping assemblyJan. 7	7.1	Training Sept. 16	219	Pulp-mill wastes go 1.700 ft. under-	
Temperature High-temperature ionization process		Analog computation course offered by electronics firm (N)Sept. 2	4.8	ground (N)	82
from Imperial Chemical Industries		electronics firm (N)		Residue burner consumes troublesome	23
High-temperature metals Ross & Mc- Henry (charts & table)Nov. 25		Engineering technicians are helpful but		wastes (C)	20
Low-temperature metals Abraham		cost a lot to train (C)Dec. 9 Engineers to educators: give students	83	Waste Treatment	82
Hurlich (charts & tables)Nov. 25 Measuring temperatures to 5,000 F. accurately (N)Aug. 5	66	more program options (C)Aug. 5 Industry turns teacher	43	Advanced waste treatment in water re- covery. Louis KoenigJune 10	210
System protects heat-sensitive chemical in pipeline Saphier & Butcher (P.N.)		Attacking technical obsolescence. M. W. KriegelApr. 29 Training engineering technicians G. L. Painting technicians G. I.	134	ACS meeting discusses developments	41
Wall temperature effects on corrosion	*118		*191	(C)	
rates Bergstrom & Ladd (charts & tables)July 8	176	Teaching engineers about computers J. P. LairdMay 27		Jan. 7 Control of water pollution. C. F. Gurn-	*40
TVA Fertilizer fights forest fires (N).June 10		Running an in-plant course P. J. BrennanJune 24 Process simulator—device for training	121	hamJune 10 Detergents degraded by chemical treat-	*190
Fertilizers will keep booming, TVA says	44	Process simulator—device for training operators Jan. 7 Trucks — Industrial trucks — Materials	*108	ment at Du Pont (N)May 27 Detergents fight each other in method	78
Nitric acid plant contract awarded to	**	handling report Avers & Rhodes		that removes ABS (C)June 10 Detergents—will research or legislation	86
Chemical & Industrial Corp. (C) Feb. 18	79	(tables)Sept. 16	*158	solve pollution problems? (C). Feb. 18 Paper mills share waste plant (N)	82
Wilson Dam, Ala., plant's new granu- lators (N)	*104	Carbon-steel tubes for low-temperature service, R. C. Angell (chart)May 13	*208	Sept. 2 SCAT—foam fractionation process—gets	*42
Terephthalic Acid Mobil buys Olin Mathieson patent for		Controlling corrosion in carbon-steel tubes, H. F. Hinst (charts)Jan. 7	*110	full-scale test (C)Sept. 30 Shortcut approach to fission-product	38
intermediate process important in making polyester fibers and films (C)		Thermal resistance of pipes and tubing. David Stuhlbarg (table) (P.N.)		recovery (N)	*94
Feb. 18 Terephthalic acid-to-polyester fiber	77	Tungsten Nov. 25	132	removes ABS, phosphates (C). Feb. 4 Waste water renovation symposium at	36
route gets Japanese plant (C) July 8	6.3	Fluidized-bed fluoride process yields pure tungsten granules (C)Oct. 28	72	AICHE meeting (N)	*124
Testing Activation analysis matures as indus-		Tungsten carbide coatingsOct. 14 Tungsten diselenide—Space-lubricant sys-	110	flects widespread concern (C)Feb. 4	31
trial tool (chart) (N)Dec. 9 Computer aids testing of solid propel-	*95	tem from Westinghouse (N).June 24 Tungsten disulfide	56	Cooling water — silica concentration gives blowdown rate. J. S. Beecher	
Corrosion effects of wall temperatures	100	Dispersions for high-temp lubricants or oil additives	70	(P.N.)June 10 Cooling with seawater. Gus Heine-	
Bergstrom & Ladd (charts & tables) July 8	176	Dry lubricantJuly 22	98	Heavy water plant to be built in Nova	188
Corrosion of metals in acetic acid Eisenbrown & Barbis (tables)	***	\mathbf{U}		Scotia (C) Dec. 23 Water: supply, treatment, disposal, re-	21
Corrosion test for stainless is new.		U. S. Army—Power Sources Conference—fuel-cell session (C) June 10 83, (N)		covery-report (charts & tables) June 10	*167
fast May 13 Hydrostatic testing device simplifies	***04	Uranium	54	Planning the plant water supply. W. G. GuytonJune 10 Design and operate for water econ-	
work-hardening of pipelines, process vessels (C)Jan. 7	26	Canadian mines turn cost-wary in face	62	omy. Partridge & PaulsonJune 10	175
Liquid hydrogen kept liquid—goal of test (N)May 27	78	Europe may face shortage (N). Apr. 15	90	Reusing municipal waste water. T. F. SullivanJune 10	
Pipelines—nitrous oxide now used for tracing leaks (C)Jan. 7	28	Uranium carbide — High-intensity-are process yields pure carbides (C)	86	Water treatment for plant use, M. E. GilwoodJune 10	
Plastic missile components yield to X-ray scrutiny (N)Jan. 21	*60	V Apr. 15	86	Cooling with seawater. Gus Heine-	100
Psychological testing—an inside look J. R. Conley June 10		Vacoum		GurnhamJune 10	190
Pump-testing facility at Allis-Chalmers gives buyer more data (N). June 24	*46	High-vacuum line successfully sputters tantalum (N)	*98	Desaiting of seawater. D. F. Othmer June 10	205
Statistics in chemical engineering L. B.	44)	Improved hot well for vacuum ejectors, M. Fridman	•132	Advanced waste treatment. Louis	210
Andersen see Statistics Tetra-azadiene—Japanese catalyst pro-		Vacuum poses tough hurdle for space lubes (chart) (N)May 27	*74	The case for evaporation suppression, V. K. La MerJune 10	213
motes free-radical reactions at low temperatures (C)Apr. 1	17	Valves Ball valves—Better ball valves spark		Automatic analyzers help combat Ohio	
Tetrakia (hydroxymethyl) phosphonium chloride for fireproofing fabrics now		wider use. D. S. Antrim (charts) May 13	*185	River pollution (map) (N)Feb. 4 Control of water pollution, C. F. Gurn-	*48
available commercially (C)July 22 Textiles	7.4	Comparison of flashing-valve sizing		han	*190
Acrylic emulsion finish for fibers, fabrics	62	methods. E. J. Lapadula (charts & tables) (P.N.)	125	biodegradable products (chart) (N) Aug. 5	*52
Antistatic agent	142	A portable mechanical valve-operator. Colley & Davidson (P.N.)Mar. 18 Variable-flow, constant-pressure nozzle.		Detergents—industry promises "soft" detergents as Congress probes pollu-	
cheaply (chart) (N)Jan. 7	*40	B. M. Johnson (P.N.)June 10	*236	tion (C)June 24	33

Great Lakes to get U.S. water-quality		x		Boas, Arnold H.	
Pollution—the public image. R. J. Drake (QED)	52	X-rays		Pt 2 How to use Lagrange Multi-	***
Water Repellants		Plastic missile components yield to X-ray scrutiny (N)Jan. 21	*60	Pt 3 How search methods locate	
Waterproofing agent for masonry called SurtisealJan. 7	50	Point-projection microradiography can probe polymer structure (N). Apr. 21	58.	optimum in univariable problems Feb. 4	*105
SurtisealJan. 7 Zepel—Du Pont fabric finish repels water (C)Jan 21 48, Mar. 4		X-ray analyzer extends computer's con- trol scope (C)Oct. 14	83	Pt 4 Optimizing multivariable func- tions	*97
Water Sample		Xenon Xenon hexafluoride (C)Apr. 29	52	Pt 5 Optimization via linear and dynamic programming Apr. 1 Bobis, Arthur H.	*85
Desalting and power plant proposed for Key West, Fla. (N)July 8 Desalting—Fresh water from vapor-	74	Xenon trioxide synthesized, isolated at Oak Ridge (N)Apr. 15	103	Trouble-shooting the uncontrolled vari-	
		Pure xylene isomer from pulse-column		Bradstreet S W	*185
P. J. BrennanOct. 14 Desalting — more methods proposed:	-110	process (chart) (N)Aug. 5 p-Xylene plant boasts revamped process		Refractory coatingsDec. 23 Brauweiler, J. R.	77
bustion	81	(N)Sept. 16	82	Economics of long-vsshort-life ma-	
bustion Mar. 18 Desaiting—NATO proposal shuns usual energy sources (N) Dec. 23 Desaiting newsmaker—England's mist	42	ATTENDED INDEN		Brennan, Peter J. Fresh water from vapor-compression	
	60	AUTHOR INDEX		evaporation	•170
Desalting of sea water. D. F. Othmer (charts)June 10	*205	Allport, H. B.		Running an in-plant course June 24	*66
Desalting—outlook cloudy for joint nu- clear-desalting plants (N)Dec. 9	98	Pressure drop of air in activated carbon beds	132	Brinkerhoff, R. & F. A. Holland How to scale up cost estimations	
Desalting plants—another one for San	52	Correction		Brinkerhoff, Robert & others	97
Desalting study pegs big-plant economies (table)Oct. 14 Desalting—Texas & College solvent	102	CE Refresher — Statistics in chemical		Designing many-plate distillation col- umns	*159
Desalting—Texas &M College solvent extraction process gets pilot plant		engineering Pt. 4. Statistical estimation gives	117	Correction	252
(N) July 22 Desalting—thin-film vapor compression	82	Pt. 5. Tests and estimates on the sta-	150	Adjustable balance wheel aids unroll-	
process offers savings (chart) (N) Apr. 15	96	tistical meanFeb. 18 Pt. 6. Tests and estimates on the sta-	100	ing of material	-134
Design and operate for maximum		tistical varianceMar. 18 Pt. 7. Analysis of variance provides	191	unit	-290
water economy, Partridge & Paulson (charts) June 10	175	techniques for rapid data reduction Apr. 15	157	Choosing copper alloys for heat-trans- fer equipment	*130
Evaporation suppression for conserving water. V. K. La MerJune 10	213	Pt. 8. Regression analysis correlates relationships between variables			
Planning the plant water supply. W. F. Guyton (chart, tables, maps) June 10	170	Pt. 9. Multiple regression techniques	173	in pipeline	*118
Reusing municipal waste waters, T. F. Sullivan (charts & tables)June 19	179	correlate experimental data	223	Estimating transfer coefficients	
Waste water renovation explored at professional meetings (C) Feb 4 31,		Pt. 10. Nonparametric statistics pro- vide comparisons between distribu-		Evaluating transfer coefficients	
Water Treatment	124	tions	139	Carlson, Rowland C. & others	*105
Desalting and power-producing plant proposed for Key West, Fla. (N)		sign of experimentsAug. 5 Pt. 12. Factorial design of experi-	113	Designing many-plate distillation col- umns Feb. 18	*153
July 8 Desalting by reverse osmosis and a new	74	ments	*99	Correction	252
diffusion still discussed by ACS (C)	49	Carbon-steel tubes for low-temperature service	****	Anhydrous ammonia via Casale proc-	•62
Apr. 29 Desalting—Fresh water from vapor- compression evaporation — flowsheet.		Antrim, Doran S.	-200	Chapus, E. E. & Elle Condollos Solids pipelines	
P. J. BrennanOct. 14	*170	Better ball valves spark wider use May 13	*185	Transporting solid materials in pipe-	*98
Desalting—NATO proposal shuns usual energy sources (N)Dec. 23 Desalting newsmaker: England's mist	42	Arne, Frances Better fabrication boosts plastics sales		Designing solids-handling pipelines	•131
heat transfer (N)	60	Fiber makers ride off in all directions	*78	Operating solids pipelines. July 22 Charlton, Francis R.	
(charts)June 10	205	New outlets gang up on hydrochloric	•52	Maintenance painting	*150
(charts)June 10 Desalting — outlook cloudy for joint nuclear-desalting plants (N)Dec. 9	98	acid glutOct. 28 Rigid urethane foam girds itself for	*76	when to paint	*140
Desalting plants—another one for San Diego? (N)	52	Arnold, T. H., Jr. & C. H. Chilton	*84	Surface preparation, paint applica- tion, and inspectionDec. 23 Chilton, Cecil H. & T. H. Arnold	
Desalting study pegs big-plant econ- omies (table)Oct. 14 Desalting—Texas A&M College solvent	102	New index shows plant cost trends Feb. 18	143	New index shows plant cost trends	
		Asch, Victor Predicting and using liquid-boiling be-		Chopey, Nicholas P. Feb. 18	143
Desalting—thin-film vapor compression	82	havior	*125		*34
process offers savings (chart) (N) Apr. 15	96	A survey of modern chemistry—CE Re- fresher		Clark, E. L. A hard look at safety in high-pressure	
Desalting—two more methods proposed: solvent extraction, submerged com-		Atomic structure in modern chemis-	*97	research	183
bustion (C)	81	try Sept. 30 The chemical bond in molecular structures Oct. 28		Multiplying factors give installed costs of process equipmentFeb. 18 Coe, B. P. & M. P. Scarbel	182
dual-purpose filter, gives clearer water (chart) (N)May 13	*90	Chemical hands explain formation of		Toward more accurate tank-level gag-	
	*60	molecules	97	Colley, T. L. & H. C. Davidson	98
of oil spillsJune 24 Swimming pool disinfectant—potassium iodide compoundSept. 30	36	of the elementsDec. 23 Ayers, E. D. & A. W. Rhodes Materials handling and bulk packaging Sept. 16	01	Portable mechanical valve-operator Mar. 18	200
Synthetic flocculants set for plunge into	*98	Sept. 16	•157	Colman, John E. Countercurrent washing calculations	
water (table) (N)Apr. 15 Tertiary treatment removes ABS, phosphates from domestic wastes (C)		Banford, Charles R. IMC's new plant shows off latest phos-	*100	Condolios, Elie & E. L. Chapus	*93
Feb. 4 Waste water renovation symposium at	36	phoric know-how May 27 Barbis, Peter R. & C. M. Eisenbrown	100	Solids pipelines Transporting solid materials in pipe-	
ACS meeting (C)Feb. 4 Waste water renovation symposium at	31	Corrosion of metals by acetic acid Apr. 29	*148	Designing solids-handling pipelines	*93
AIChE meeting (N)Nov. 11 Water treatment for plant use. M. E.	124	Barton, H. Dudley Selecting plastic equipment for chem-	****	July 8 • Operating solids pipelinesJuly 22 •	131
Gilwood (charts & tables)June 10	183	ical plants	-188	Conley, Joseph R. An inside look at psychological testing	
Wax-making plant features new cata-		Improved design for acetone strippers Feb. 18	*174	Cook, E. M. & others	230
lytic hydrogenation process (C) Sept. 2	25	Beecher, J. S. Silica concentration gives cooling-water	****	Design and use of spray dryers Pt 1 Principles and applications	
Weather Gulf Coast cold weather precautions		blowdown rateJune 10 Beiswinger, George L.	*238	Sept. 30 Pt 2 Design and costsOct. 14	*83
pay off (N)	*48	Training engineering technicians May 13	•191	Cooper, Herbert W.	201
ready (C)Oct. 14 Wine—Fermentation inhibitor substitutes	90	Belcher, D. W. & others Design and use of spray dryers			148
for pasteurizationJune 24	62 114	Pt 1 Principles and applications Sept. 30	*83	Cross, Bruce Making paper from cane bagasse	
Wood-Siding gets 7-year finish with		Pt 2 Design and costsOct. 14 5 Berenson, Conrad	201	Cushing, Ralph	*74
World Petroleum Congress		Educating tomorrow's managers Feb. 4	110	Improving personal filing systems Jan. 7	*73
Meeting in Germany reports multi- process advances in oil technology		What is your chance for promotion? Sept. 30	1100	Davenport, William H. Novel recovery puts rhenium within	1
Plans set for meeting in Germany (N)		Bergman, D. J.	*91	industry reachJune 24 Davidson, H. C. & T. L. Colley	*86
Writing Mar. 4	54	Regatrom, D. R. & R. J. Ladd		Portable mechanical valve-operator Mar. 18 *	200
Encourage engineers to write. R. E. SiegfriedJuly 8	150	Effects of wall temperatures. July 8 Billitzer, A. W.	110	De Chazal, L. E. Marc Least-squares method finds sets of	1
Ten common weaknesses in engineering		Device adds solids to reacting auto- claves	100	constantsJuly 8	160
reports. J. R. GouldOct. 14 * What managers look for in engineering		Estimate number of plates from boil-		Guide to insulation costs for vessels Apr. 15	186
reports (table)Mar. 18 *	196	ing pointsAug. 5	126	Apr. 19	





Dodds, Robert L. Streamlining maintenance paperwork	Havighorst, C. R. AP&CC's new process separates borates	Leonard, R. E. & J. T. Muench Quick calibration of horizontal cylin-	
Doolin, John H. Centrifugal pumps and entrained-air	from ore by extractionNov. 11 *228 Separating glass sand from clay June 10 *158	drical tanks	184
Douglas, Fred R. & others	Heinemann, Gus Cooling with seawaterJune 10 188 Hibbard, Walter R., Jr.	Control-Operation Technique. Feb. 18	*135
Guidelines for estimating profitability Aug. 19 145 Driskell, L. R.	Composites: materials of the future Nov. 11 *203	Anodic protection against corrosion Nov. 11	263
How to select the best flowmeter Mar. 4 *83	Hillyard, Warren F.	Lothholz, W. Klaus Pressure-drop in long viscous-fluid pipe-	*89
Edwards, John P. Reinforced plastics curb corrosion Dec. 9 206	How to simulate large chemical proc- esses	Loucks, Charles M. Are you in a rut in maintenance?	
Eisenbrown, C. M. & P. R. Barbis Corrosion of metals by acetic acid	tubesJan. 7 *110 Holland, F. Anthony Obstacles to job progressOct. 28 144	Apr. 29 Luss, Dan Caustic seal protects pumps in acid	*140
Endres, Richard V. New trend toward "mixed" compres-	Scale-up series Chemical reactorsApr. 15 °145 Holland, F. A. & R. Brinkerhoff	gas service	118
sion	How to scale up cost estimations Feb. 4 97	Finding the log mean on the log-log slide ruleSept. 30 Mallinson, J. H.	•118
Ericson, Dale R. Nov. 11 241	Holland, F. Anthony & others Designing many-plate distillation col- umns	Chemical process applications for com- pression evaporationSept. 2 Mantell, C. L.	+75
Gas impingers find dust load of water- saturated gas	Howard, Donald R. & others	Where do ChE's come from?July 8 Margolin. Stanley V.	154
Polyethylene film protects fume vent from weather	Continuous corrosion measurements Jan. 21 *140 Huang, Chen-Sian	Carbonization of lignite reaches com- mercial stageJuly 8 Marsik, Fred V. & others	108
that monitor stream variables	Control of ion migration reduces HCl losses July 8 *162 Hubben, Herbert	Aug. 19	145
Evans, George E. Preventive maintenance of analog com-	What is an engineer worth?Apr. 1 *96 Hughson, Roy V.	Martin, Godfrey Q. Relate filtration to heat transfer Jan. 21	*103
puters	Combating hot sulfur-bearing gases June 24 *138 Nickel plating for product purity	Martino, Robert L. Plain talk on critical path method June 10	221
Fair, James R.	Hurlich, Abraham	Mattozzi, Mario & Frank Lipinski	
Vaporizer and reboiler design. July 8 *119 Aug. 5 *101 Fetter, E. C.	Low-temperature metals Nov. 25 *104 Isaacson, Franklyn and C. H. Viens Equilibrium data for argon, helium,	Control-Operation Technique. Feb. 18 McAllister, R. A. & D. J. Carra Anhydrous ammonia via Casale process	
Durometer can measure coating thick- ness on steel	methane in ammoniaJan. 21 136 Jahreis, Carl A. Clearing up some misconceptions about	McEwen, Christopher K.	*62
Glass reinforcement for plastics July 22 168	James, Edward W.	Heat exchange in glassSept. 2 McHenry, H. T. & E. W. Ross High-temperature metalsNov. 25	•97
Finn, R. K. An easy way to estimate pH of weak acids or basesSept. 2	Analog computers provide electrical model	McLellan, J. M. Managing engineering projectsMay 13 Michalson, Arthur W.	
Fishtine, Stanley H. Equations find physical constants for	Pressure-relieving systems Design considerations July 8 *125 Components Aug. 19 *151	What's new, practical and important in ion exchange	•163
Use expansion coefficients for density	How to calculate back pressures in vent lines	namic programmingOct. 14	
Fochtman, Edward G. & others Continuous corrosion measurements	Johnson, Benjamin M. A variable-flow, constant-pressure noz- zleJune 10 °236	Monroe, G. E. Steam tracing unplugs air-transport system	
Forman, E. Ross Unit control systems—a new concept	Johnson, Thomas E. Buying chemical pumpsAug. 5 138 Jones, Gerald C.	Moore, Robert E. Materials for water desalting plants Sept. 30 *124, Oct. 14	
Fraade, D. J. & E. E. Escher How to evaluate process analyzers that	CPI problems in the emerging countries Apr. 1 *69	Morelli, G. W. & Frank Rusinko, Jr. Graphite and carbon as engineering	224
monitor stream variablesSept. 30 *89 Franks, Roger G. E.	Jones, Lee A venturi feeder for fluid-bed systems ; Sept. 2 *112	Muench J. T. & R. E. Leonard	*69
design	Jones, S. C. & A. G. Oberg Liquid-liquid extractionJuly 22 *119 Kaldenberg, Don E.	Quick calibration of horizontal cylin- drical tanks	184
Fridman, M. An improved hot well for vacuum	How to find that better jobDec. 9 190 Kapo, George & Seymour Calvert	Nomogram calculates permeability fac- torJune 10	242
ejectors Jan. 21 *132 Funk, E. J., Jr. Inert-gas systems: a roundup. Oct. 28 *117	Penetration theory Estimating transfer coefficients Feb. 4 *99	Nemhauser, G. L. & L. G. Mitten Optimize multistage processes with dy- namic programmingOct. 14	*195
Furnas, Clifford C. How we can meet the nation's indus-	Evaluating transfer coefficients Mar. 4 *105 Kirk, Michael M.	Oberg, A. G. & S. C. Jones Liquid-liquid extractionJuly 22	
trial research needs—guest editorial May 27 *113 Garner, Hal G.	Electrical-equipment purchase costs June 10 244	Oliver, Earl D. Predict nonideal behavior in vapor- liquid equilibria	123
Analog simulates steady-state bal- ances	Koenig, Louis Advanced waste treatmentJune 10 210 Kouzel, Bernard	Othmer, Donald F. Desalting of seawaterJune 10	*205
Gaska, R. A. Single-stage pressure extractorJuly 8 *158 Glipin, James W.	Equation quickly scales reactor variables	Parekh, Kishor H. Heat exchanger scheduleFeb. 18 Parker, Norman H.	180
Conventional synthesis makes unusual refractory materialOct. 28 110 Gilwood, Martin E.	Casebook of a corrosion detective Feb. 4 *122	Equipment specifications White better mixer specifications	****
Water treatment for plant use. June 10 *183 Gleekman, Lewis W.	More cases of a corrosion detective Feb. 18 *186 Kriegel, Monroe W.	Aids to dryer selectionJune 24 How to specify evaporatorsJuly 22	*115
Corrosion-resistant metals Nov. 11 *217 Gordon, David Getting started in consulting May 13 *179	Attacking technical obsolescence Apr. 29 134	Selecting the best vendorsAug. 19 Partridge, E. P. & E. G. Paulson Design and operate for water economy	*161
Gould, Jay R. Ten common weaknesses in engineering	Kuong, Javier F. Chart estimates critical volume of compounds	June 10. Paulson, E. G. & E. P. Partridge	.*175
reportsOct. 14 *210 Gouldsmith, A. F. S. & B. Wilson Recovery of platinum metals still chal-	Labine, Roland A. The job outlook 1964Nov. 25 *124 Older engineers take it on the chin	Design and operate for water economy June 10	•175
Gries, W. H.	Apr. 15 *173 Ladd, R. J. & D. R. Bergstrom Effects of wall temperaturesJuly 8 *176	Phillips, John C. & others Basic roles for analog computers Apr. 29	*99
Adjustable restriction accurately con- trols flowJan. 21 *134 Device yields true sample from vary-	Laird, J. Packard Teaching engineers about computers	Plank, C. A. & others Pressure monitoring of packed towers Nov. 25	*190
Cuccione Fugere	La Mer. Victor K. May 27 *140	Polentz, Lloyd M. Automatic level controller for powders	-120
Flowsheets Feb. 18-128, Mar. 4-76, Mar. 18-156, Apr. 1-62, Apr. 15-138, Apr. 29-92, May 13-150, July 22-112, Aug. 5-86, Aug. 19-138, Sept. 2-68,	The case for evaporation suppression June 10 213 Landgon, William M. & others	Pollak, Henry M. Sept. 30	
Sept. 16-150, Sept. 30-16, Nov. 11-196,	Continuous corrosion measurements Jan. 21 *140 Lapadula, E. J.	How to select centrifugal pumps. Feb. 4 Popper, Herbert A fresh look at contract maintenance	*81
Gurnham, C. Fred Control of water pollutionJune 10 *190	Comparison of flashing-valve sizing methodsAug. 5 128	Apr. 1 Last year's explosions prod safety push	104
Guyton, William F. Planning the plant water supply	Lee, Allan E. What's ahead in process control June 24 *99	Price. Frederick C.	•91
June 10 *170 Hamm, Hans W. Design of vessels under external pres-	Lee, Chesman A. Hopper design up to dateApr. 1 *75	Old SBR line stretched to make stereo rubberJan. 21 Ratcliffe, J. S.	•84
How to mize chevron or square pack-	Practical tips for removing oil and grease from waterFeb. 18 *176 Lemlich, Robert	Predicting consecutive reactions Sept. 30	*101
Hauth, Willard E., Jr.	Test your CEQ Jan 21 136, Feb. 18 178, Mar. 18 202, Apr. 15 180 May 13 198, June 10 240	Rhodes, A. W. & E. D. Ayers Materials handling and bulk packag- ing	*157
Ceramic oxidesDec. 9 185	2-10-10		

Index to Vol. 70, January to December 1963

Richardson, Wingate H. How to foresee operating difficulties	Nomograph solves ideal-gas-law prob-	Guidelines for estimating profitability	
Oct. 14 *216	lems	Aug. 19	14
Who will fill the vacation void?	Siegfried, Robert E.	Wagner, William F.	
May 27 *146	Encouraging engineers to write. July 8 *150 Smith. D. A. & others	Analog methods aid simulation of re- action kinetics	*10
Rodriguez, Ferdinand	Design and use of spray dryers	Wales, C. E. & O. R. Schweitzer	4.0
Finding order of chemical reactions Aug. 19 *159	Pt 1 Principles and applications	Phase equilibria	
Rogers, T. J. & others	Sept. 30 *83	Phase rule and equilibria relations	
Pressure monitoring of packed towers	Pt 2 Design and costsOct. 14 *201	May 27	
Nov. 25 *130	Smith, John O. & others Tables simplify analysis of non-iso-	Equilibria in one-component systems June 24	*11
Ross, E. W. & H. T. McHenry	thermal reactorsApr. 15 153	Behavior of one-component systems	
High-temperature metals Nov. 25 *97	Smith, L. C. & L. C. Tao	July 22	
Ross, Jack and others Guidelines for estimating profitability	Improved method for correlating non-	Equilibria in two-component systems	
Aug. 19 145	linear data	Aug. 19	*16
Ruchti, William	Evaporation	Phase equilibria in binary systems	
Why Charlie can't leave Nov. 11 *250	Stapleton, Robert N.	Sept. 16	-19
Rusinko, Frank, Jr. & G. W. Morelli	The unsafe-acts inspection Aug. 19 185	Webb, Henry E., Jr. Coping with the fire menaceDec. 9	19
Graphite and carbon as engineering materials Dec. 23 *69	Street, Howard H.	Weber, Arthur P.	
Ruszkay, Richard J.	Comparing techniques for appraising project alternatives	Selecting propeller mixersSept. 2	*9
How to analyze control program for	Stuhlbarg, David	Weinberger, Arthur J.	
distillation columnApr. 29 *112	Thermal resistance of pipes and tubing	Economic evaluation of R & D projects	
Sackheim, Lt. Robert L.	Nov. 25 132	Improving R & D's batting average Oct. 28	12
Nursing the big birdsMar. 4 *115 Salmon, Royes	Sudbury, J. D. & C. E. Locke Anodic protection against corrosion	How to estimate required investment	
New chart finds rate of return . Apr. 1 *79	Nov. 11 268	Nov. 25	11
Saphier, L. L. & R. E. Butcher	Sullivan, Thomas F.	Calculating manufacturing costs	
System protects heat-sensitive chemical	Reusing municipal waste waters	Weiner, Susan	0
in pipeline	Tanzer, Ernest K. June 10 *179	Simple method determines brine con-	
Tables simplify analysis of non-iso-	Comparing refrigeration systems	centrationsJune 10	23
thermal reactors	June 10 *215, June 24 *105	Weiss, Alvia H.	
Scarbel, M. P. & B. P. Coe	Tao, L. C. & L. C. Smith	Determining paths for reactions. Apr. 1	- 8
Toward more accurate tank-level gag- ingDec. 23 98	Improved method for correlating non- linear dataOct. 14 193	Westphalen, Hans Equalizing line improves condenser	
Scheiman, A. D.	Thorne, H. C. and D. C. Wise	operationOct. 28	*15
Nomograph sizes catalyst-bed support	Computers in economic evaluation	Whalen, J. J.	
grating	Apr. 29 *129	Selecting and maintaining packings Nov. 11	995
Schneider, R. W. Aerosol method measures flow of gases	Torres, A. F. & S. S. Feuer Glass reinforcement for plastics. July 22 168	Wheeler, D. H. & J. E. Yocom	20
Sept. 30 *112	Troyan, J. E.	How to get the most from air-pollution	
Schweitzer, O. R. & C. E. Wales	Using common senses in plant operation	control systemsJune 24	*126
Phase equilibria	Mar. 4 *120	Whittlesey, John W. The role of foremen in labor griev-	
Phase rule and equilibria relations May 27 *117	Tully, Thomas J. Gravity feeder solves gummy problem	ances and arbitrationJuly 22	*155
Equilibria in one-component systems	May 13 *196	Wilder, David R.	
June 24 *111	Uhl, V. W. & H. P. Voznick	Brittle engineering materialsNov. 11	450
For parts 3, 4, and 5 see C. E. Wales Schwing, Richard C.	Molten sait for heat transfer. May 27 *129	Williams, Dale T. Cracks under the microscopeMay 27	*15/
Chart simplifies tubular reactor design	Uris, Auren Guidelines for leadershipFeb. 18 166	Wilson, B. & A. F. S. Gouldsmith	10
Aug. 5 130	What's ahead for middle management?	Recovery of platinum metals still chal-	
Seglin, Leonard	Aug. 19 *176	lenges engineers	• 90
How to price new productsSept. 16 181	Van Winkle, Matthew & G. E. English	Wise, D. C. & H. C. Thorne	
Serven, Edward J. Centrifugal pumps and rotative speed	Efficiency of fractionating columns Nov. 11 241	Computers in economic evaluation Apr. 29	*125
Apr. 1 *81	Viens, C. H. & Franklyn Isaacson	Yocom, J. E. & D. H. Wheeler	
Severance, W. A.	Equilibrium data for argon, helium,	How to get the most from air-pollution	
Monolithic tank liningsJune 10 *248	methane in ammoniaJan. 21 136	control systemsJune 24	-126
Shapiro, Leonard Charts find concentration of oleum-	Von Der Heydt, Bruce What do bosses need from their fore-	Yost, C. W. & others Pressure monitoring of packed towers	
sulfuric blends	men?Feb. 4 116	Nov. 25	*130
Delta equations speed up concentration	Voznick, H. P. & V. W. Uhl	Zimmerman, Arthur	
calculations Oct. 28 152	Molten salt for heat transfer. May 27 *129	Creativity can be taughtJuly 22	*162

